MONTANA OUTDOORS

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MONTANA OUTDOORS

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THE COVER

As the day closes on these two Flathead Lake ospreys, we should worry about this species. Look for this issue's cover story (page 2) for reasons why this could be their last day. (photo by Doug MacCarter)

The back cover, Cutoff Mountain with Slough Creek in the foreground, is only one example of the beauty of the Absaroka-Beartooth wild area. (photo by Bob Anderson)

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ASHTON'S

a livable environment for WILDLIFE is a quality environment for MAN

WE'VE COME A LONG WAY

Today's threats to wildlife are more serious than at any time in Montana's history. It's difficult to comprehend the environmental impact of extensive strip mining, overzealous energy development, exploding population growth or the fast-moving recreational land grab.

How far are we already behind? Will we ever be able to slow or halt destruction of fish and wildlife habitat?

Wildlife—game and nongame—act as environmental indicators. By watching their demise or success, we can predict our own. Some may think that it isn't too serious if one or two species disappear . . . "after all, we have lots more."

But *every* species is important. When one disappears, it's a sign of bad times ahead for all animals, including man. It's a sign of a lower quality environment—something to which *every* Montanan must object.

I believe Montana is blessed with a higher level of environmental awareness than most of our neighboring states. Just look at any newspaper on any day. Think of the number of environmental bills introduced in this legislative session. Consider how many sincere conservation organizations were created in recent years. Ten years ago, environment was only a concluding phrase in political platforms. Now, it's a major plank and the initial thrust of many political circles.

Yes, we've come a long way. But we humbly contemplate what lies ahead—the longest, hardest struggle of all. I plan to help this department do everything within its power to maintain a quality environment for all Montanans, including our wildlife. Any help we receive will be most welcome.

Wes Woodgerd

Wes Woodgerd, Director
Department of Fish and Game

THE COVER STORY

story and photos by
Doug and Don MacCarter

Final Call for Montana's Finest Fisherman?

After five years of detailed study, these researchers concluded the overuse of pesticides could be spelling doom for the Flathead Lake osprey.

A normal osprey clutch. Unfortunately all osprey nests aren't this productive. Some eggs don't hatch because hard pesticides have destroyed the parent's ability to surround her egg with a protective shell.

The very fact that the osprey is a master angler may mean its demise. For toxic chemicals collect in fish and then slowly build up in the bird itself.

FISHERMEN LIKE TO tell of their catches and near catches, going into detail on the time, temperature, bait and lure. But one highly efficient angler puts even the most expert fisherman to shame. It boasts an 80 to 85 per cent success ratio and has never spent a dime in a sporting goods store. In addition, that angler, the osprey, usually captures its prey on the first try.

My brother and I have been interested in birds of prey since our boyhood days in Billings, so the osprey study was a natural for us. It began in the beautiful Flathead Lake area in June 1966 and was originally planned as a six- or eight-week project. However, with help from Dr. Jim Koplin, associate professor of wildlife management at Humboldt State College, Arcata, Calif., it grew into five summers of work and observation.

Flathead Lake osprey usually return from their wintering areas in late March or early April. The entire breeding population (not including previous seasons' nestlings which remain three years at their winter feeding grounds) arrives within one or two weeks. The males arrive first; the females follow in two or three days.

FINAL CALL continued

Pairing and nest site possession begins immediately.

Courtship is mainly a nuptial display since most of the birds are already mated. Their ceremony consists largely of aerial gymnastics by both sexes, swift pursuit-flight races, soaring, swooping and hovering in wide circles. The males usually carry a fish in their talons.

Ospreys prefer nest sites in the tops of dead trees along shorelines although a few pairs select live trees. The large nest (3 to 5 feet in diameter) is an ingenious accumulation of sticks on tops of broken snags or in forks of trees.

During our summers at the lake, we discovered 56 nests. Not all were used by nesting pairs; some were "housekeeping" nests for bachelors or bachelorettes. Of the "active" nests (those containing eggs and/or nestlings), approximately 75 per cent produced one or more nestlings.

Eggs (two or three and rarely four) are laid in late April or in early May. With very few exceptions, the female handles the 33-day incubation. The young usually hatch the first week in June and fledge (first flight) sometime during the second week in August.

Throughout the incubation period and early stages of the brooding period (chicks cared for by mother), the male provides food for his mate and developing young. If he's hungry, he eats the head and viscera before dropping the fish into the nest. The female feeds herself and while brooding, alternates between feeding the chicks and herself. After six weeks, nestlings are strong enough to stand up and feed themselves, so both parents provide food, dropping it into the nest and flying away.

While the male is fishing, the female perches on the edge of the nest or spends her time rearranging the nesting material. When other birds fly over the nest, she often displays a frenzied, defensive behavior, especially if the passer-by is a blue heron. The blue heron seems especially annoying to her, and she will crouch in the nest and whistle loudly or execute a defensive attack.

She grows restless and utters shrill chirps when her mate approaches the nest with a fish. The young raise their heads to watch him as he circles and lands on the nest. He grips the edge of the nest with one talon and delivers the fish with the other, then retires to a favorite perch where he rests and preens his feathers.

Nestlings feed one at a time. They may try to intercept a piece of fish, but are usually patient and polite. When one chick is satisfied, the next one steps up for its turn while the first wobbles to the edge of the nest to nap. The entire feeding ritual occurs several times a day.

When fishing, the osprey flies 20 to 100 feet above the water, scanning the surface until it sights a fish. It hovers in the air, rapidly beating its wings, then suddenly plunges feet first and hits the water, sometimes disappearing completely beneath the surface.

The osprey and bald eagle are the only fish-eating North American birds which enter the water feet first. Scale-like projections on the bottom of their talons help hold the slippery fish.

The osprey's plunge is successful four out of five times. With fish in claws, it surfaces, takes flight and then manipulates the fish so the head is pointed in the direction of travel. Then, after circling the area to gain elevation and regain its bearings, the bird heads back to its nest.

Both Doug and Don MacCarter hold B.S. and M.S. degrees in wildlife management. They worked for the department on the fishery section of the Stillwater Ecology Study last summer. And now both are teaching in Minnesota.

The osprey is almost totally dependent on fish for food. Salmon, yellow perch, lake trout, peamouth chub, cutthroat trout, largescale sucker, lake whitefish, black bullhead and sunfish have all been observed in osprey nests. But largescale suckers and lake whitefish are preferred by the Flathead osprey.

Our study revealed other facts about the osprey. In recent years, the Flathead Lake osprey have experienced a marked population decrease. Our study indicated organochlorine insecticides that affect the thickness of the eggshell and the egg's hatching ability may be responsible for the decline. Based on our studies, we have grave doubts about the future of the osprey.

Between 1967 and 1970, some 30 per cent of the osprey eggs failed to hatch. Twenty addled (spoiled, rotten) eggs were collected for pesticide analysis (gas-liquid chromatography). The eggs all contained well-developed chicks in various stages of decomposition and sizable concentrations of DDT and its metabolites (compounds produced by the body's use of DDT).

These chemicals interfere with the production of carbonic anhydrase, an enzyme active in eggshell development. Chlorinated hydrocarbons (organochlorine pesticides like DDT) inhibit the enzyme's activities and cause a decrease in the thickness of the eggshell. The chemicals also affect the female's calcium metabolism.

DDT also induces liver enzymes that reduce the estrogen level in the blood. (Estrogen is the female hormone responsible for calcium build-up and its re-

duction contributes to thinner, weaker eggshells.)

We compared shell thickness of the addled eggs with "normal" eggshell fragments found near nests containing osprey chicks. The normal eggshells were much thicker than the shells from abnormal, undeveloped eggs. These measurements were compared with the chromatography analysis, and we found the least amount of pesticide residue in the thicker shells of hatched eggs.

In conjunction with egg analysis, samples of osprey food were collected in two groups, from the nests and from the waters of primary feeding areas. Traces of DDE (DDT partially broken down) were found in all samples of fish. The greatest concentration of DDT residue, however, was found in the lake trout, a fish near the top of the food chain.

DDT and other chlorinated hydrocarbons are easily absorbed by living organisms from the environment through the food web. DDT is absorbed by the plant life in the water, fingerlings feed on algae and larger fish feed on fingerlings, getting a more concentrated dose of DDT.

The osprey, the top of the food chain, gets an even larger dose. The bird feeds on the fish and ingests all the accumulated residues.

Where do the harmful chemicals come from? The cherry growers on the east and south shores of Flathead Lake frequently apply Cherry Fruit Fly "Dust," a harmless chemical, but some use hard pesticides as well. In addition, the entire Flathead Valley is sprayed to control gnats. Extensive studies of inlet streams and the lake are needed to pinpoint the source and site of contamination.

At Flathead Lake the average nest produces one fledgling each year. Mortality rates based on banding records of Henry and Wight (Bureau of Sport Fisheries and Wildlife in Laurel, Md.) suggest that an annual production of more than one young (1.22-1.30) per breeding female is necessary to maintain a stable osprey population in New York and New Jersey.

If Flathead Lake ospreys are subject to similar mortality schedules, the Montana population is declining at a rate of three to four per cent each year.

The first North American Osprey Symposium was held in Williamsburg, Va., in February 1972. At it, Paul Spitzer (Ph.D. candi-

Checking osprey nests is no easy task.

FINAL CALL continued

date in zoology from Cornell University) said, "Ospreys are more than just birds to be enjoyed. They are an alarm system of things gone haywire in the river, the estuary and the sound. They are sensitive indicators of the environment, and this is precisely why all birds are important."

Nesting sites and ample food resources (containing very little or even better, no, pesticide residues) are of prime importance to the osprey if the species is to flourish. The osprey, like any other form of wildlife, depends on a proper and pure habitat. It's much easier to maintain or increase population levels than to bring a species back from the brink of extinction.

That's the lesson our five-summer study taught us, and it's a lesson others should keep in mind.

Wise use of some pesticides and the retirement of others can keep the Flathead Lake osprey population thriving. But overuse and misuse of certain chemicals such as some presently used on the area's famous cherry orchards may mean taps for Montana's expert angler.

ZERO POPULATION GROWTH

When the Census Bureau finished adding up their figures for 1972, they came up with a startling new development.

For the first time ever, the U. S. "fertility rate" dropped below the 2.1 children per family necessary for the population to replace itself.

In fact, their population projections indicate that if the present trend continues, there will be almost 17 million fewer Americans in the year 2000 than was projected one year ago. And zero population growth (at about the 277 million level) might be reached by the year 2050.

Of course, that's not just around the corner. But it is an interesting thought. So interesting, in fact, that sociologists and scientists and businessmen are already starting to rearrange their thinking.

According to NEWSWEEK, the average age of Americans will rise, companies keyed to infants and young adults will experience a decline and fewer teachers and schools will be needed.

THERE ARE BOTTLES

Non-returnable bottles require 4.7 times as much energy to produce as returnable bottles. And this takes into consideration the energy required to transport, wash and sterilize the returnable bottle.

. . . THEN THERE ARE CANS

Perhaps the ultimate in recycling—finding a use for steel and tin cans—is closer than we think. The Environmental Protection Agency has awarded three grants totaling $11.3 million for new types of solid waste processing. The grants, given to the cities of Baltimore, Md., San Diego, Calif., and Lowell, Mass., were awarded for new types of resource-recovery systems that featured magnetic separation of cans.

Aluminum cans are easily recycled since they contain only alumnium, but "tin cans" pose a problem because they are actually made of steel sheeting, covered with tin to keep the can from corroding. And to recycle the metal in the can, the two (the steel and the tin) must be separated.

PEANUT BUTTER, JELLY AND NEWSPAPER SANDWICHES

Though it's a long way off, housewives may one day add, "And a pound of newspaper," to their weekly grocery order.

Scientists at the University of Aston in Birmingham, England, have found a way to convert newspapers into animal food. A recent issue of Surveyor, a government technology journal, described recent trials using large quantities of newsprint in the diets of beef and dairy cattle.

The tests showed that the paper was nontoxic, nutritious and did not affect yields of beef or milk.

UPI, who reported the news, couldn't help adding one additional thought, "Will bad news be as easy to digest as good news?"

ECOLOGY FOR KIDS

Everyone, it seems, has gotten on the environmental bandwagon. Even toymakers.

Just before the Christmas rush, the nation's toymakers came up with playthings like an Environmental Action Lab, a Johnny Horizon Environmental Test Kit and Nature's Window, a kit that lets a child watch plants germinate from seeds.

Aimed at young people between the ages of 8-16, the kits encourage an "environmental education." "The environment is bound to be important this Christmas because so many people are interested in it," said Edward Parker, president of Parker Brothers, before the Christmas onslaught. "Sets that show plants growing have been in the toy business for a long time," noted Lionel Weitraub, president of the Ideal Toy Corp., "but now children can actually observe their environment through their own tests."

But it appears the latest toy craze hasn't been altogether successful. As the owner of two stores in southern Oregon, Al Bonotto, put it, "When the rational thinking that's implied in one of these environmental kits is matched up against a noisy dragster that shoots sparks, it just can't compete."

TENDERIZER FOR BITES

The Health Insurance Institute has recommended a new treatment for insect bites—meat tenderizer.

A solution of one-fourth teaspoon tenderizer and one tablespoon water, rubbed into the skin at the site of the sting, stops virtually all pain "within minutes," according to the institute.

It said the tenderizer method was much more effective than the textbook remedy of applying ice or ice water to bites.

recycled paper

editorial

OLD WILDLIFE MYTHS THAT NEVER DIE

Sometimes it gets discouraging. No matter how we say it, how often we say it or where we say it, the message still evades part of the general public.

After decades of beating the drums of sound fish and game management, a few "old wives' tales" (old "wildlife" tales, if you wish) still dominate when fish and wildlife pop into the conversation.

Virtually every day, we hear, in effect, one or more of the following statements:

—"We used to have lots of deer around here until they started shooting does. Now, we're lucky if we even see one during the hunting season."

—"Oh, you work for the Fish and Game, huh? I always wanted to be a warden, too."

—"The grouse hunting used to be fantastic around here, but now the coyotes have gotten them all."

—"The kids used to go down to that stream and catch a nice batch of trout any time they wanted. Now, Fish and Game doesn't stock it enough, so it's not worthwhile to even try it."

—"I used to get my elk every year, but since they started that early bull season, I can hardly catch a glimpse of one."

—"I wish they would close the season so the game herd could build up."

—"The foxes are so thick around here that a pheasant doesn't have a chance."

—"Why, five years ago we could go down anywhere along the shores of Fort Peck and catch all the pike and catfish we wanted. Now, after they let those commercial fishermen in there, we can go fishing for three days without getting a bite."

—"I'd better blast that hawk before it gets all my chickens and most of the pheasants."

—"The lions move in there every winter and clean out all the deer. It's no wonder we don't have any game around here."

—"There's one thing I can't understand. Why do we let all those nonresidents in here? Why they've taken over almost every good hunting area in the state."

—"I'm deathly against the state getting any more land. We hardly have anything left on the tax rolls now."

—"I wish the legislature would cut Fish and Game's budget. I'm sick and tired of paying taxes to raise fish and publish magazines."

These and similar statements can be heard any day of the year. We have calls. We have visitors. We hear them over Thanksgiving dinner. We hear them almost anywhere we stop and listen.

For decades, we've tried desperately to bury these myths for good. But they're still alive.

My questions are: Will it ever change? Will we ever be able to convince the public to believe sound management policies backed up by factual research data instead of these myths? If it is possible, how long will it take? How should we do it? And, most importantly, will fish and wildlife become casualties of our inability to get the correct message across?

There's an easy answer to most of the previous accusations. In fact, the solution to all but a few is a single word. It's the most commonly used word of Fish and Game people. It's not the answer to every problem, but it solves most. It's truly the key to quality fish and game populations. It's HABITAT.

"Here we go again," some might say.

recycled paper

"Every time I pin them down, they drag out their Bible and start preaching 'habitat'."

Preach we will. Because habitat destruction is positively the most serious threat to our fish and wildlife.

Why is it so hard to understand that an animal—fish, wildlife or man—must have food, water and a place to live in order to survive? What would the population of Alaska be in winter months if there were no houses? How many would survive there without enough food or water? These questions are even more appropriate for Montana wildlife.

We can jack millions of fish and thousands of game animals into a ruined habitat and create an artificial situation. But then it must be perpetuated regularly. Game won't make it through the first winter, and fish stocked in low quality water disappear in short order. Without quality habitat to maintain a healthy, reproducing population, we're only wasting time and money.

Predators, hunters or special seasons don't destroy grizzly, grouse, pheasant, deer or elk populations. However, highways, subdivisions, pesticides, s t r i p mines and agricultural monocultures take a heavy toll.

Too-much-fishing, commercial fishermen, not-enough-fish-hatcheries aren't the basic problems facing today's anglers. Lack of adequate streambank vegetation (habitat), an abundance of large artificial impoundments with variable water levels, bulldozed streams, siltation from agriculture and poor logging operations, pollution from cities, agriculture and industry and other ruiners of aquatic ecosystems do, however, mean less fishing.

Mother Nature renews her fish and wildlife resources each year. Every fish caught or animal shot is quickly replaced the next spring. That is, as long as there's a quality environment to support them.

The side subjects, all of which have received equal coverage in MONTANA OUTDOORS and other department information sources, are equally important . . . and the statements equally false.

The Department of Fish and Game does pay taxes on our lands. The counties receive just as much property tax income for the land we own as they did when it was under private ownership. The sportsman's dollar goes to the counties in lieu of taxes, and we feel the pinch of tax increases just as any other property owner does.

We're bound by state law to allow only 10 per cent of the total licenses to go to out-of-staters. So, even though only one out of every ten hunters is a nonresident, that minority brings in almost 60 per cent of our license income. That money goes to perpetuate wildlife (game and nongame) populations for both residents and nonresidents (hunters and nonhunters).

All Fish and Game personnel are not wardens. There are biologists, researchers, information specialists, park planners, administrators, game range managers, education specialists, maintenance men and many, many more. Our law enforcement division handles (with wardens) the very necessary chore of enforcing the fish and game laws. Unfortunately, everyone doesn't feel obligated to "honor" these regulations, so official enforcement is needed. But law enforcement is not the only (and not the primary) function of this department. We're here to manage and preserve Montana's most valuable renewable natural resource — fish and wildlife.

Even though this department is a state agency, it receives very little of its funding from general fund tax dollars. And if it weren't for the maintenance of a few state parks and recreation areas, the Montana taxpayer would contribute zero to the Department of Fish and Game. The small appropriation from the general fund amounts to 4 per cent of our total budget. The remaining 96 per cent comes from license fees and special taxes on sporting equipment.

So ends another attempt to convince the public to believe in sound management policies and to discount myths they hear at bridge parties and in the local pub. We're concerned about the fish and wildlife resource. It's our moral and legal obligation to protect it.

Is anyone listening?

Will the old myths die?

We're beginning to wonder—*Bill Schneider*

recycled paper

edited by
Bill Schneider

THE CATCHALL

jeeps and the environment

If you plan to buy a new Jeep, look forward to getting a "Code of Environmental Ethics" along with your payment schedule.

Ed Zern, a noted outdoor writer, wrote the 13-point code which will be handed out to each buyer of a new Jeep (a wholly-owned subsidiary of American Motors).

The code, which Zern calls a "Golden Rule of Environmental Protection," reads as follows:

—I will appreciate the solitude and beauty of our natural environment, and respect the feelings of others toward it.

—I will ask myself, each day out-of-doors, what values of nature attracted me there, and do all I can to preserve those values.

—I will not drive where I cannot leave the land essentially the same as before I drove across it. If it is fragile enough to show vehicle scars, it is too fragile for travel by vehicles.

—I will always gear down to prevent wheel-spin on wet or soft ground.

—Wherever possible I will travel by established roads and vehicular trails.

—I will leave no litter—not a bottle cap, can tab, gum wrapper or film tab. I will carry out what I carried in, and if possible, more.

—Because noise is alien to wilderness, I will equip my vehicle with the most effective muffler and will urge that manufacturers improve this feature.

—I will not drive my vehicle in any area posted against such use. I will observe the laws and regulations of every public authority, and report all violations of such rules.

—I will not drive near to, chase, or disturb any animals, wild or domestic.

—I will not drive on private property or carry firearms there without the owner's permission. I will not damage fences, and will close all gates.

—I will keep my vehicle in good mechanical condition, for safety's sake and to prevent excessive exhaust fumes and oil leaks.

—If I wish to race up steep slopes or over rough terrain for sport, I will be sportsman enough to do so only in those places designated for such use.

—I will join my local off-road vehicle club as a working member, aware that such groups can be a beneficial force for driver education and proper use of our outdoor resources.

SPRINGBOARD

"Why did the U. S. in 1970 export almost 14 per cent of the total annual harvest of wood suitable for lumber production?

"The fact is that cutting is expanding at a rate that threatens to destroy the forests entirely in the near future and that industry pressures to increase this rate stem in part from the large amount of wood exported each year to Japan. If this wood were sold instead to domestic manufacturers, the growing pressures on our remaining forest resources would be eased considerably."— *Gordon Robinson, SIERRA CLUB BULLETIN*

FOR DISCUSSION

a blacktailed whitetail?

For decades, hunters have suspected that whitetail and mule deer interbreed and produce "hybrids." But facts have been somewhat lacking and the department has generally discounted the idea—at least until now.

During the past few years, several apparent "hybrids" have appeared in Musselshell and Hill counties. The tails of the unusual specimens were shaped like those of whitetails, in general, but were almost completely black on top and totally white underneath. That appears to be a combination of the two species. (Mule deer have tan, rope-like tails with black tips, and whitetails have brown, fan-like tails with white underneath.) The length of the ears was also intermediate between the two species.

"Hybrid" antlers had long brow

recycled paper

tines (a vertical spike close to the base of each antler) which is a dominant whitetail characteristic. However, the remainder of the antler displayed dichotomous branching, a mule deer trait where each branch splits into two and those two into two more.

Although too early for definite conclusions concerning the hybrids, investigators are attempting to answer some questions. Gary Dusek, department planning ecologist at Roundup, and Steve McCann, a Roundup biology teacher, have collected and measured a variety of bones from whitetails, mule deer and suspected hybrids. So far, they've determined that a particular bone formation in the skull of "hybrids" is intermediate in size between a whitetail and mule deer. But they need additional samples before drawing definite conclusions.

One final bit of convincing evidence was the fact that every observation of "hybrids" was in an area inhabited by both species.

LICENSE PLATES FOR WILDLIFE

Washington has a "new idea" with definite possibilities.

The State Game Department will introduce legislation next year to allow the sale of personalized license plates. The resulting funds (they predict about $250,000 annually) will go to manage nongame wildlife species. In

Montanans are being bombarded by advertising that says, in effect, strip mining of coal is needed to keep lights burning across this state. If, as the utility industry implies, coal is needed to meet power demands in the Treasure State, then it would probably be approved by many Montanans.

The trouble is, most of the coal is going out-of-state and NOT to Montanans. Last fall, I visited the Western Energy operation near Colstrip. At that time, the Montana Power Company subsidiary was shipping most of its coal to be burned by Northern States Power Co., Minneapolis, Minn., and by Commonwealth Edison, Chicago.

Generally speaking, the same holds true for other Montana strip mining operations.

In this decade, the nation's three largest coal companies have been purchased by non-coal corporate powers — Consolidation Coal by Continental Oil in 1966, Island Creek by Occidental Petroleum and Peabody Coal by Kennecott Copper, both in 1968. (Peabody and Consol are active in Montana.)

Also along that line, Standard Oil of New Jersey has become one of the two largest holders of coal reserves.

Does this indicate a trend to lump the major energy sources —coal, oil and uranium—in the hands of a few powerful corporations?

"On August 4th (1971), the Interior Department signed an agreement with the gas industry that will add $80 million in federal funds to $40 million from gas and pipeline companies for a four-year acceleration of existing work on small-scale but working pilot gasification plants. Some $176 million more in federal money has been set aside for the next step — construction of a full-scale demonstration plant."—*New York Times*

In view of that, can we depend on the federal government to help us control strip mining in Montana?

The Central Ohio Coal Company boasts of its pride and joy, "Big Muskie," which the company claims is the world's largest earth-moving machine. Tall as a 32-story building, its 310-foot boom is fitted with a bucket capable of devouring 220 cubic yards of earth per bite. Steel cables operating the bucket are 5 inches in diameter. It weights 27 million pounds and consumes enough electricity to supply a small city. Part of that power operates 170 electric motors ranging from 40 to 2,000 horsepower. Some of the motors help the monster machine "walk" on four hydraulically operated "shoes," each of which is 20 feet wide and 65 feet long.

In its official newsletter, the Montana Chamber of Commerce urged Montanans to support coal development. "It seems clear," the Chamber said, "that if Montana is to realize its fair share of the plant investment related to coal mining, a climate which encourages development (more like that of Wyoming) is necessary."

Montana senators Mike Mansfield and Lee Metcalf have joined forces in proposing that Eminent Domain statutes be changed or revoked. This law allows utilities, railroads, etc., to condemn land for their right-of-ways.

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THE CATCHALL

most states, including Montana, that function rests on the shoulders of the sportsman and is funded by license dollars.

Carl Crouse, director of the Washington department, commented on this, saying, "The hunting and fishing license-holder has, for 40 years, furnished, at no cost to the state's taxpayers, funds to administer a hunting and fishing program; however, no funds have been available for those department programs aimed at non-hunted species."

The plan, which creates no additional burden for Washington's taxpayers, is expected to have strong support.

WE DON'T BELIEVE IT

At an October 1972 discussion of the Fort Missoula land-use master plan, a U.S. Army spokesman, Harry Price, said, "The Army has always been ecologically minded."

BAN ON SNOWMOBILES

The SPORTS AFIELD magazine reports that France is preparing to put a complete ban on all personal use of snowmobiles. Apparently, the excessive noise and the thoughtless actions of a few, that, in turn, give the entire sport a bad reputation, brought on this action.

A WORTHY CHALLENGE

When the topic of dams vs. free-flowing rivers comes up, you never know what's going to happen as the following example will appropriately exemplify.

It seems the Oregon Water Resources Board had decided to favor retaining the remaining sections of the Snake River in their natural, free-flowing condition.

That's great, but it's only half-a-paradox.

The Idaho Water Resources Board strongly supports dams on the Snake River. That, in itself, isn't surprising. In fact, the Idaho board would be more "normal" as far as water resources boards go. The Oregon body would have to be considered a maverick.

"Okay, they take opposite opinions, so what?" you might be saying about now.

But there's more.

The Middle Snake River separates the two states, forming the boundary of each. And High Mountain Sheep Dam on that free-flowing river is being actively discussed and cussed.

What will happen now that Idaho wants the dam and Oregon

Say Hello Again to "Say, Goodbye"

Anyone who thought they'd seen the last of "Say Goodbye," should take another look. Today, instead of televised "entertainment," it is returning under the guise of "education" in library and school systems across the country.

The Conservation Education Association's "Critical Index of Films and Filmstrips in Conservation" is supposed to be "a selection of the best visual aids to assist teachers and others interested in imparting a better understanding on the interrelationships of man and his environment." Listed under the category "Man's Impact on the Environment, Wildlife," is David Wolper's film "Say Goodbye." Its caption reads, "A good presentation of natural predation and territoriality as opposed to man's predation for profit or for kicks. Excellent camera work and a powerful production drive home the horror of man's indifference. Should gain mass support for protection of vanishing species." The film is classed for general audiences except elementary. Elsewhere, "Say Goodbye" is being used by public library systems in their film programs, carrying its version of "environmental awareness" to unsuspecting audiences anew.

Conservationists will remember "Say Goodbye" particularly for its contrived sequence that purported to show hunters shooting a female polar bear from a helicopter, orphaning her two cubs. It was soon discovered that the female bear in the film had only been tranquilized and was, in fact, part of a research project designed to perpetuate the species, rather than eradicate them. At the time it drew fierce outcry from professional conservationists as well as other deceived viewers.

Chester Phelps, president of the International Association of Game, Fish and Conservation Commissioners, pointed out that "the program was presented in a documentary fashion leading viewers to believe that the incidents portrayed actually happened as presented." He continued, "In my view, manipulations such as this make no contribution to wildlife conservation. They do succeed in unfairly undermining public faith in federal and state wildlife officials and as the true facts become available, as they inevitably do, such incidents serve also to undermine the public's faith in television broadcasting." Vermont Fish and Game Commissioner Edward F. Kehoe condemned the show as "a malicious misrepresentation designed to reflect on sport hunting in general," and added, "Unfortunately, this sort of thing is happening more and more as some interests try to stir anti-hunting sentiments across the nation." — *Willis Hobart, National Rifle Association*

doesn't? It's easy. Idaho will just have to settle for a "half-dam."

A challenge certainly worthy of the nation's great dam builders—the U.S. Corps of Engineers and the Bureau of Reclamation. Right?

ABC FEATURES MONTANA ANTELOPE

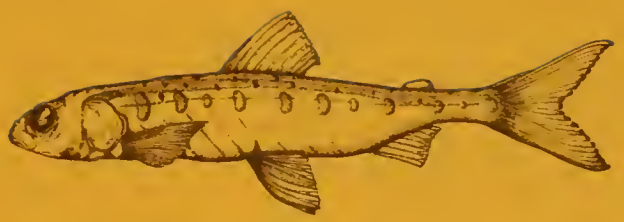
Be sure to watch ABC's outdoor serial, "The American Sportsman," on March 4, 1973. The network camera crew spent several days here last fall filming an antelope hunt which will be shown on this program.

The word's out that the show will also mention the effect the upcoming coal development will have on the antelope population and Montana in general.

NEW PAPER

Many MO readers will be happy to know that we are returning to a glossy paper with the May/June 1973 issue. This magazine is printed on a matte or dull-finish paper, which apparently is not preferred by the majority of our readers.

Who cares about the pygmy whitefish?



"Whitefish" to most fishermen means "mountain whitefish," a favorite in the fall and winter of both sportsmen and gourmets. Only a few even know of the pygmy whitefish, a native found in the glacial lakes of western Montana.

The pygmy whitefish looks like a young mountain whitefish. Both have parr marks (dark blotches on the sides), but the pygmy whitefish retains these as adults whereas the marks are lost in mature mountain whitefish. The best field characteristic separating the two species is the shape of the snout and the lower jaw. The pygmy whitefish has a less pointed snout and the lower jaw is more square in outline. (See drawing by Kristine Meiring.)

The pygmy whitefish was not reported in Montana until 1941. It remained unknown because it grows to a maximum length of only 6½ inches and frequents only the depths of lakes except during winter spawning excursions into rivers and streams. Recently the Montana Department of Fish and Game found the pyg-

NEW DIRECTOR

Wes Woodgerd has been appointed director of the Montana Department of Fish and Game.

Woodgerd, 55, joined the department in 1952 and has served in a number of capacities throughout the state. He has been game range manager in Ovando, district game manager in Miles City, assistant leader of the Wildlife Research Unit at the University of Montana, Missoula, district information officer in Missoula, district supervisor in Glasgow. At the time of his appointment, Woodgerd was administrator of the department's recreation and parks division.

The Whitehall native earned bachelor of science and master of science degrees in wildlife technology from the University of Montana, Missoula. He and his wife, Jo Ann, have three children.

The appointment, made by Governor Thomas Judge, was announced at the December meeting of the Fish and Game Commission. Woodgerd replaces Don L. Brown.

recycled paper

THE CATCHALL

my whitefish in McDonald, Bull, Flathead, Seeley, Swan, Ashley and Little Bitterroot lakes.

Why should we care about a small fish that provides no sport or table fare? Aside from its interest to naturalists, it's a vital link in the food chain. It feeds on small crustacians and the larvae of midges, and then, in turn, it becomes food for the larger Dolly Varden and lake trout which inhabit the depths of lakes. *—George Weisel, Zoology Dept., University of Montana*

HUNTING AND FISHING SURVEY

The "1970 National Survey of Hunting and Fishing" is finally out and has some interesting findings. Although the figures are about two years old, they nevertheless can be applied to today's outdoor activities with only slight changes.

The Bureau of Sport Fisheries and Wildlife, working with the Bureau of the Census, published this survey and similar ones in 1965 and 1960 and some of the statistics are compared to the earlier findings.

Some of the more interesting results are:

—55 million Americans fished, hunted or both during 1970 and spent $7.1 billion in the process.

—the number of fishermen decreased by one million and hunters increased by two million (from 1965).

—of that $7.1 billion spent by both hunters and fishermen, only 2.6 per cent went for licenses.

—total per day expenses for selected groups were $6.30 for fresh water fishermen, $9.73 for waterfowl hunters, $7.62 for small game hunters and $17.47 for big game hunters.

—thirty-four per cent of the nation's households contained at least one angler and eighteen per cent at least one hunter.

—one out of every ninety-four women hunted and one out of every nine fished.

—one out of every five men hunted and one out of every three fished.

LANDOWNERS OF THE YEAR

Last fall, the Montana Fish and Game Commission named several Montana landowners as "Landowners of the Year" for their outstanding accomplishments in improving landowner/sportsman relations.

We're optimistic about the landowner/sportsman issue because of the actions of these men and several other developments (see "the Catchall," Jan/Feb 1973 MO). Let's hope the trend continues to a point where it's difficult to pick landowners who have done "the most" to improve relations with the sportsman.

The Burlington Northern railroad received the award from our Kalispell (northwestern Montana) district.

(Two of the landowners chose not to be named here because they feared the extra publicity would bring more sportsmen to their already heavily used land. Please keep this in mind if you know any of these men.)

Hans Anderson

Eldon Barnard

Connie Cox

Herb Huennekens

John Wegner

Next Time

Watch for these features in the May/June 1973 issue of MONTANA OUTDOORS

—float the wild Missouri

—Montana coal (part 3) Is reclamation possible?

—the paddlefish

—commercial fishing

—the mountain goat

—antelope fawning time

MONTANA FLORA

AND WHAT IT MEANS TO WILDLIFE

WILLOW

Willows are shrubs found on moist sites all the way from high alpine meadows to lowland stream banks. They're deciduous—they shed their leaves each fall—and they're important plants for wildlife.

Stands of willows, like these in this valley, provide essential forage for moose. Depending on the season, willow also appears in the diets of deer and elk in some areas of Montana. Willow buds provide some food for upland game birds.—*Harley Yeager*

MONTANA COAL—part two

by Bill Schneider

be glad you aren't an antelope

EDITOR'S NOTE—In past weeks, we've received many comments on our special coal issue (January/February 1973). Most encouraged us to continue our strong stand on the impending coal development because of its obvious threat to fish and wildlife. The following article, number two in the series, deals with the environmental impact of the development. Next time, we'll take an in-depth look at reclamation. We welcome your comments.

"FROM OUR PARTICULAR point of view, the fish and wildlife resources could lose 770,000 acres of excellent habitat and 2.6 million acre-feet of water. It is certainly not too early to begin thinking of the impact this development will have on the fish and wildlife resources of southeastern Montana and the aquatic ecology of the Yellowstone and Missouri rivers."

Former Director Don L. Brown sounded that warning in the March/April 1972 issue of MONTANA OUTDOORS. However, his apprehensions were evidently not taken seriously because they're already coming true.

The strippers of Montana coal are now in full swing, altering the state's rural heritage and prairie productivity to a point that it may never be returned.

No, everyone is not standing idle, willing to allow the destruction of a relatively unspoiled environment. Much is being done to put a handle on the stripper and industrialist. That, however, is another story for another time.

The immediate concern of this feature is the actual environmental impact of the development. The quality of the land, air and water of southeastern Montana ranks among the best in the nation. The land—productive and stable, the air—some of the purest anywhere, the water—the essential element, the fish and wildlife—nationally famous, all stand to lose unless preventive safeguards become the order of the day.

Fish and wildlife are biologically and intimately connected to the land, water and air. The umbilical cord, once cut, can rarely

be spliced. So, this department views the pending air pollution, water shortage and land destruction as a direct detriment to the fish and wildlife resource we're morally and legally obligated to manage and preserve for future generations.

fish, recreation and water

The outlook for the fishery which heavily depends on the Yellowstone River and its tributaries appears particularly dismal. The future of fishing depends, of course, on the availability of quality aquatic habitat in the form of pure, unpolluted water. And the limited supply of that essential element in southeastern Montana seems to be in such great demand that fish and recreation might simply become unfortunate casualties of increased industrial water consumption.

At least that's the fear of Art Whitney, administrator of the department's fisheries division. He thinks strip mining itself will have little effect on water quality other than some stream siltation which probably won't be too serious. "The main effect," Whitney notes, "will come from water requirements for processing the coal and converting it into energy, not from the actual mining."

As he sees it, the impending development poses four major threats to fish and recreation:

—a drastic reduction in the flow of the Yellowstone River and tributaries which will adversely affect the excellent warm water fishery found there, and trout as well.

—the possible construction of Allenspur Dam, near Livingston, which would destroy more than 50 miles of blue ribbon trout stream (11 per cent of Montana's total).

—the addition of thousands of new anglers who may over-fish some of the area's smaller waters and are certain to cause fiery landowner / recreationist troubles which will, in turn, cause fishing access problems.

—temperature and salinity pollution problems aggravated by water consumption and subsequent flow reduction.

Regarding the flow of the Yellowstone River and its tributaries, we'll illustrate how figures can vary depending on who's doing the figuring and why.

The Bureau of Reclamation (BuRec) in its now infamous North Central Power Study (NCPS), prepared in conjunction with 35 major utilities, estimates the water need of the industrial complex at 2.6 million acre-feet. The BuRec claims that this need constitutes only about one-third of the river's total flow.

Careful analysis, however, finds that in dry years, the river's flow is only one-half of its normal average, according to John Goers, reclamation specialist for the Montana Department of State Lands. "The same 2.6 million acre-feet would probably be consumed regardless of how much water Nature leaves in the river. In dry years, the projected water consumption would leave only 19 per cent of the average flow in the river. That doesn't look good for the river or the agriculturalists who depend on it for irrigation!"

Who's got the correct number? For the fish and the angler, it doesn't make a whole lot of difference. Present agricultural and other uses, coupled with a one-third reduction, would seriously harm the fishery, and when paired with an 81 per cent reduction, fishing would only exist as a memory.

So, assuming the worst, Yellowstone River anglers might someday wade across their favorite fishing hole without getting the tops of their socks wet. Assuming the best, they can look forward to less fishing.

Another equally severe problem, as noted by Whitney, is the possible construction of the highly controversial Allenspur Dam, near Livingston. If Allenspur becomes a reality, 25 per cent of the blue ribbon section of the Yellowstone River will disappear.

Supposedly this proposal is on the BuRec's "back burner." But to some that means it's being considered but not talked about.

For decades Paradise Valley (area that would be flooded) residents, along with state and national conservation organizations and this department, have objected to the proposal, saying it should be taken off the "back burner" and forgotten forever. But plans for Allenspur still live.

Although BuRec says it isn't considering the Allenspur site, the federal agency lists it as a possible reservoir in the NCPS and in its Montana-Wyoming Aqueduct Study.

BuRec engineers estimate the cost of building the dam (without a power plant) at $125 million. That figure, say local real estate appraisers, wouldn't begin to pay the equities on the land the dam would flood. Other aftermaths of the construction include re-routing and/or re-construction of U.S. Highway 89 and four Yellowstone River bridges and compensation for a railroad right-of-way from Livingston to Gardiner.

And then there's the known fact that Livingston lies in a fault zone. The proposed dam site is above the city which means Livingston residents would live in fear of a disaster of earth-shaking proportions.

The problems of Allenspur are too numerous to be treated here, especially since it appears as

WILL THIS WARNING MEAN MORE NOW THAN IT DID LAST YEAR?

Montana Coal continued

though the BuRec has decided to direct its efforts elsewhere and forget about Allenspur . . . at least for awhile.

A letter by H. E. Aldrich, regional director of the BuRec, (page 19) seems to bear out the thinking of some that the BuRec never says "no" but just "maybe."

A comparable situation to Allenspur is the Lower Teton Dam, now under construction in southern Idaho. An article in TETON magazine, authored by Dr. Frank Craighead Jr., took that development to task and exposed what appears to be a gigantic hoax and a grave injustice.

Last year, a coalition of environmental groups brought suit against the BuRec to obtain an injunction against construction of the Lower Teton Dam. But they withdrew their legal action when Secretary of Interior Rogers Morton reviewed the project and decided against it. Russell Train, chairman of the President's Council on Environmental Quality, concurred. However, just before the agreement was finalized, it was announced the dam *would be built, bids were let and initial construction begun* before anyone really knew what was happening.

In the TETON magazine, Craighead theorized, "Apparently, controversial Lower Teton Dam received its go-ahead after President Nixon personally intervened.

"Opponents of the dam continued their court action but were disappointed by the outcome of a motion for a preliminary injunction. The U. S. District Court in Boise, Idaho, did not permit the introduction of any evidence regarding the cost-benefit ratio or the overall impact of the construction activities. At this time District Judge Fred M. Taylor also barred specific testimony concerning the Bureau of Reclamation's failure to comply with the National Environmental Policy Act (NEPA) in the preparation of a detailed environmental impact statement."

For more than 50 years the Allenspur site has been proposed. Each time the BuRec advances it to the front burner, it is cooled by public outcries.

Now, James Parker of the power division of the BuRec says Allenspur "has been shelved." And regional director Aldrich assures us there's "no plan to construct a dam at the Allenspur site."

Even Montana Power, with its deep-rooted interest in this state's energy problems, condemns the Allenspur site. In a letter to the Livingston Enterprise, J. E. Corette, chairman of the board and chief executive for the giant utility, concluded that the proposed reservoir is " . . .uneconomic and wasteful and that (the dam's) construction would result in very extensive damage to the economy of the (Livingston) area."

What more could conservationists ask for? But then what more could the opponents to the Lower Teton Dam ask for than a direct refusal from the Interior Department and the Council of Environmental Quality? But, as you read this, the concrete is hardening in Lower Teton Canyon. Opponents of Allenspur can't relax. Anyone who believes Allenspur can't happen is fooling himself.

Although Allenspur is certainly the most hotly contested of the various water developments proposed to meet the industrial development's water needs, it's far from alone. The BuRec's Montana-Wyoming Aqueduct Study suggests diversion of Yellowstone Basin water to the extreme southern border of Montana and into Wyoming to satisfy the thirst of massive power generating plants.

The thought of diverting Yellowstone water to fire coal-burning generating plants in Wyoming met some serious opposition among Montana officials, including former Governor Forrest Anderson. He did, in fact, voice one of the loudest objections, saying the proposal failed to consider environmental effects or Montana's own need for the water.

And then there's several reservoirs that, according to the BuRec, must be built if Allenspur isn't. That means two impoundments on the Tongue, one on the Clark's Fork of the Yellowstone, another on the Big Horn and two more on the Powder.

Aside from the actual water problems, the development is expected to bring approximately 300,000 people to the southeastern section of Montana. The 1971 census estimates the population of the eight southeastern counties at 39,465. That's at least a *700 per cent increase* in a relatively short period of time.

Such an influx will have tremendous socio-economic effects that will be detailed in a later issue of MO. But, from an angler's point of view, that many people will have a direct and detrimental effect on the fishery.

Whitney feels the increasing numbers of fishermen coupled with few places to fish because of dewatering may cause serious problems for his division. He foresees a mushrooming public demand for more fishing opportunities and the inability of a diminishing resource to meet that need. "We'll need more money, more

YELLOWSTONE RIVER ANGLERS MAY GET AN OPPORTUNITY TO WALK ACROSS THEIR FAVORITE FISHING HOLE WITHOUT GETTING THEIR SOCKS WET.

United States Department of the Interior

BUREAU OF RECLAMATION
Upper Missouri Regional Office
P O Box 2553
Billings, Montana 59103

Gilbert Gibson, President
Park Electric Co-Operative, Inc.
P. O. Box 908
Livingston, Montana 59047

Dear Bert:

Thanks for the editorial comments of Mr. Martin regarding the Allenspur site for a potential dam and reservoir.

Even with publication of the reports on North Central Power Study and the Montana-Wyoming Aqueducts, there is no plan to construct a dam at the Allenspur site. In truth, our report has attempted to show that the Eastern Montana coal developments could be supplied water by developing the tributary streams within the Yellowstone River Compact (Clarks Fork Yellowstone, Bighorn, Tongue, and Powder Rivers) plus offstream storage along the Yellowstone River between Billings and Miles City. These developments for storage and diversion would be an alternative to a reservoir on the Yellowstone proper.

Notwithstanding efforts of the Bureau of Reclamation to preserve the upper Yellowstone as a free-flowing river, it is a fact that the best of all storage sites within the basin happens to be at the Allenspur location, and it is impossible to disregard its mention in planning studies either for water availability or for flood prevention in the lower Yellowstone valley. It is natural for Montanans residing in Miles City, Glendive, and Sidney to look toward all solutions to their frequent flooding and ice jam problems, and the entire river is within their area of consideration.

So, while the Bureau of Reclamation currently agrees with you that the Allenspur area should be preserved, we should all recognize the imminent and growing importance of the site.

Sincerely yours,

H. E. Acheson

Regional Director

personnel, more access areas and more biological data to assure the resource would not be destroyed forever," Whitney warns. "And the sportsman's dollar just won't stretch that far. One alternative may be severe, restrictive regulations which would cause widespread resentment."

He also sees a landowner/recreationist problem with that many people seeking outdoor leisure. "Many prime fishing areas along the Yellowstone and other waters could simply be closed off to the public because of the sure-to-come thoughtless actions of a few."

Whitney's fourth, but certainly not least, major problem area with the development is thermal pollution and increased salinity of water as the river's capacity to dilute pollutants is reduced with each additional diversion.

"State water quality standards will require industry to keep hot effluents from increasing stream temperature," Whitney notes. "However, the evaporative action of cooling water temperatures may increase the concentration of dissolved salts in what is already some of the state's most saline water. Already some natural hard-water lakes in Montana and North Dakota are too salty to support game fish."

All in all, the effect on the fishery promises to be catastrophic at the least. Time will tell whether the problems are insurmountable or not, but if they are, Whitney thinks mining should be denied in certain areas. "We just can't afford to let unreasoned industrialization destroy an important fishery."

wildlife, a product of the land

How will our wild things fare amid stark spoil piles, gaping

Montana Coal continued

strip mines, gigantic electric generating plants and grossly altered plant communities? Very poorly, says Joe Egan of the department's game management division.

"To keep abundant wildlife populations, we must have productive land," Egan notes, "and the way it looks right now, strip mining won't leave quality wildlife habitat in its wake.

"During the mining operation there are, of course, *no* benefits for wildlife. The big question is 'Will there be any after the strip miner has finished tearing up the land, and reclamation begins, and will there, in fact, be any wildlife habitat *after* reclamation?' It's the moral obligation of the miner to renew the land's ability to produce wildlife—that boils down to the return of quality habitat. If he doesn't take that duty to heart and instead maneuvers to get someone else to do his job or does a half-way job himself, Montana's wildlife will just be out-of-luck."

The needs of wildlife are complex, and the habitat must supply these needs in the correct quality and quantity to sustain life. When the stripper uproots that habitat, dumps it in scattered spoil piles for awhile and then, months or even years later, spreads it back over the land in a haphazard manner, there's no way everything will be the same.

(In the third article of this series, MO will describe reclamation problems and possibilities in detail. Reclamation will have a very direct effect on the future of wildlife in southeastern Montana.)

One particularly crucial aspect of reclamation and its effect on wildlife involves topsoil salvage and re-use. The diverse habitat needs of wildlife are provided now by the multi-species plant communities found in southeastern Montana. These *must* return after mining.

This is why retention of the topsoil means so much to wildlife. Granted, the scant layer of topsoil (sometimes only two inches thick) hardly seems worth saving in many cases. Southeastern Montana plant communities evolved through eons of time, hand-in-hand with other uses of the land —all dependent on the soil, whether it was two inches or two feet deep. But that seemingly unneeded earth contains the key to abundant "native" wildlife numbers—"native" plant seeds. The same vegetative growth after mining *may* mean the same wildlife densities.

In some eastern states, reclamation efforts have resulted in heavy plant cover one or two years after mining. But it won't be as easy in eastern Montana where precipitation is only about 12-13 inches annually.

The future of the famous deer and antelope herds, prairie grouse, wild turkey and nongame wildlife will closely parallel the quality of reclamation. If the land is reclaimed to its original state, if such reclamation doesn't depend on artificial treatments such as fertilization and irrigation, and

Will the strip miner leave productive wildlife habitat in his wake?

HOW WILL WILDLIFE FARE AMID STARK SPOIL PILES, GAPING STRIP MINES, GIANT POWER PLANTS AND ALTERED PLANT COMMUNITIES?

if other land uses such as livestock grazing return, wildlife may come back. But these are a great many "ifs," and the outlook for wildlife really isn't very encouraging. The fact is—we don't really know. Strip mining and reclamation are new to Montana, and time is needed to find the answers.

Reclamation, good or bad, won't be the only effect on wildlife spawned by the coal extraction. As with the fishery, wildlife can't withstand a tremendous influx of people.

We need not fear that the extra hunters will shoot certain wildlife species into extinction. In fact, the sport itself poses no threat. But all wild things will suffer from the sure-to-come habitat destruction. Hunting will maintain herds at a level easily supported by the available range, but the amount of quality habitat will certainly be reduced, and less habitat means less wildlife.

the air,
very pure to very polluted

"Because the North Central Power Project is so large, even with present air pollution control technology and federal emission standards, it (the industrial development) will emit far more nitrogen oxide, sulfur dioxide and particulate matter than all sources in New York City and the Los Angeles Air Basin combined.

If that statement by the Environmental Defense Fund accurately describes the future of southeastern Montana air quality, Montanans can expect the dirtiest air in the nation. What is now almost a "model" for the envious public officials from famous polluted urban centers could become the filthiest air found anywhere . . . *just one big polluted sky.*

The EDF backs up its warning with a rather complex set of figures and statistics. The environmental group estimates (in addition to present content) the atmosphere would receive the following from the industrial complex, mostly from power plants: (1) 787,500 tons of fly ash (particulates) per year, (2) 2,730,000 tons of sulfur dioxide per year, (3) 1,226,000 tons of nitric oxide per year and (4) 1,879,000 tons of nitrogen dioxide per year.

Not discounting the EDF findings, state air pollution control director Ben Wake says if emissions cannot be controlled at a level less than the state's standards, "the proposed development must not be allowed to proceed." He hopes Montana doesn't become "a dumping ground for crude technology or other inferior emission control or reclamation procedures simply because people in other states need electricity or gas. Why should Montana sacrifice its existence, simply because we are not yet as dirty as they?"

Wake also foresees attempts by industry to avoid the use of proper control procedures "if we are not critically watchful."

The NCPS estimates 42 steam-fired generating plants for the North Dakota-Montana-Wyoming coal fields, 21 in Montana. Total output hoped for by the NCPS is 53,000 megawatts. [A megawatt (mw) is 1,000 kilowatts, or 10,000 one hundred-watt light bulbs.]

The plants, according to the NCPS, range in size from 1,000 to 10,000 mw each. The state's largest existing steam-fired generator, the J. E. Corette Plant in Billings, has an output of only 180 mw. And Montana Power's plant under construction at Colstrip will still only generate 700 mw. Both plants almost seem like playthings compared to the 5,000 or 10,000 mw monstrosities planned for the region.

The controversial 2,705 mw Four Corners Plant at Farmington, New Mexico, provides a good example of the air quality problems Montanans can expect. That plant emits 465 tons of particulates *each day* and its pollution "plume" can be seen 140 miles away. Sulfur dioxide and other pollutants are also belched into the sky in generous quantities. And Montana stands to get 21 of these plants, some of which will be 3½ times as large as the Four Corners plant.

Ben Wake, who has a vital role in controlling environmental damage, sees the "gold rush syndrome" in the development of Montana coal. "This syndrome is characterized by hasty judgments and a numbing of the normal spirit of compassion and concern for each other and the land.

"Now is the time for steadiness, a piercing review of all development schemes and an unrelenting demand for better air pollution control and reclamation procedures—even if it means waiting a little while longer. To allow such devastation, as Montana has in the past, is one thing, but to permit it again, when we know how to prevent it, is unforgivable."

So ends a plea for sound judgment and advance planning to lessen the environmental impact of southeastern Montana coal development. Do we, as Montanans, accept the decision that the coal must be stripped and the plants built? Can we tolerate a lower quality environment? Will this warning be more effective than it was last year at this time?

Time will tell.

THE ABSAROKA

LAND OF THE BIRD PEOPLE

by Bob Anderson

EDITOR'S NOTE: Bob Anderson's article, "Land of the Bird People," is another in a series on Montana's wild lands. Last spring, in the March/April 1972 issue, we featured Ruth Koch and the Beartooth Area. But most wilderness enthusiasts can't force themselves to separate these two great lands and contend they should be one article and one wilderness—the Absaroka-Beartooth. Of primary concern to conservationists is the prohibition of a corridor and subsequent road between the two wild areas. This alternative will undoubtedly cause many comments as the time of decision draws near. But regardless of what happens to the Absaroka-Beartooth, watch for continued coverage in MONTANA OUTDOORS.

WHAT IS THE Absaroka (Ab-soar-key)? It's where proud native Americans once hunted and worshipped . . . where the deep canyons and snowy peaks are still unscarred . . . where the mighty grizzly still roams . . . and where a primitive land is still a "wilderness."

This area, which bears the Crow's name for themselves, the Absaroka (the bird people), is the current focus of intense study and heated controversy. Congress passed the 1964 Wilderness Act requiring the Secretary of Agriculture to review all primitive areas to determine their suitability for wilderness designation. The Absaroka and Beartooth primitive areas review has raised many questions. Among them: Should the Absaroka be separated from the Beartooth by a road corridor?

The land, its topography, ecology and even its recent history, has a foundation in fundamental geology. The Absaroka has two major, distinct geological zones —one in the north, one in the south. The Beartooth uplift is north, a massive block of Precambrian gneisses and schists. These rocks, formed by glaciers, resist erosion and weathering.

Landforms in the north are reminiscent of the neighboring Beartooth—an alpine plateau dissected by U-shaped, glaciated valleys.

In the south, the uplift has been covered with tertiary and quaternary volcanic rock. These rocks are less durable, and erosion and weathering has significantly altered the glaciated landscape.

Compared with the Beartooth, the Absaroka is barren. A map of the Beartooth is splashed with blue; lakes abound. In contrast, Absaroka lakes are a rare delight. The southern portion has no more than 10 named lakes.

The Absaroka—a great, remote land pleading to remain whole (photo by Don Aldrich)

Northern Absaroka boasts few more. But many of these lakes contain healthy trout populations and some, in fact, are considered overpopulated. Southern Absaroka makes no apologies for its fishery. Both Slough Creek and Hellroaring Creek support thriving cutthroat populations, and Buffalo Fork houses rainbows.

Creatures common to the high mountains—the pika, black rosy finch, golden mantled ground squirrel, white-crowned sparrow and mountain bluebird—add to the setting.

So does the profusion of mountain wildflowers. Beauty is not a requisite for wilderness, but it is everywhere in the wild Absaroka.

characterized by diversity

Diversity is the dominant characteristic throughout this wild land. Elevations range from 5,000 to 11,000 feet; yearly average precipitation from 20 inches in the lowlands to 50 inches on the crests; average annual temperatures from 42° F to 30° F; winter snow accumulations from 3 to 10 feet.

Summertime temperatures often rise into the 70's, but pleasant breezes can suddenly turn into raging gusts. Torrential storms can threaten the unprepared visitor, then move on as suddenly as they appeared.

The variations in elevation, moisture and slope exposure produces a wide range of vegetation types. Plant diversity goes hand-in-hand with abundant animal populations. Sagebrush-grassland dominates some lower elevations, providing important winter range for deer and elk. Blue and sage grouse also thrive there.

At higher elevations, grassy

ABSAROKA continued

meadows form isolated openings in the forest canopy, providing important forage and cover for many wildlife species.

At elevations over 9,500 feet, alpine ecosystems thrive. Here, trees are absent or scarce. And vegetation, depending on moisture, provides forage for large mammals, complete habitat for many animals and important hunting grounds for predatory birds.

The ultimate in environmental austerity is found on the mountain tops. Here, on fierce escarpments and angular blocks of windswept rock, lichens have sole possession of the land.

history of a rugged land

The history of the Absaroka reflects the rugged nature of its climate and topography and the scarcity of exploitable resources. Artifacts and pictographs indicate people have hunted in the Absaroka for thousands of years, but it is doubtful if any established residency.

It is not clear when the first white man ventured into the Absaroka. It may have been M. de la Verandrye who passed through Montana in 1743. Or members of Captain William Clark's party who traveled down the Yellowstone in 1806. Or John Colter who, after leaving Lewis and Clark in 1806, spent several years exploring the headwaters of the Missouri and the wonderland called Yellowstone. Or Joe Meek who, in 1829, was the first white man to report crossing the formidable Absaroka.

After the wave of fur trappers in the early 1800's, a large block of land, including the Absaroka, was reserved for the Crow Tribe. Crow Agency was established on Mission Creek near the present site of Livingston in 1851. A second wave of resource exploiters (prospectors) found gold in Emigrant Gulch in 1863. An 1880 treaty retracted the reservation boundary and allowed previously clandestine mining claims to be developed. The entire area received close scrutiny from prospectors, but few producing mines were developed.

The Absaroka came under the management of the U.S. Forest Service (FS) at the national system's beginning. The FS also supervised the activities of two other groups of resource developers—loggers and stockmen. Because timber stands in the Absaroka are economically poor compared to those in other parts of the nation, logging has affected little of the Absaroka. The best timber sites are near Slough and Hellroaring creeks, where limited accessibility and other physical and biological problems make logging economically unsound.

Early stockmen faced no such constraints. At one time, virtually every open patch of vegetation was summer-stocked with sheep. But transportation costs, limited availability of dependable herders and deteriorated range conditions have since markedly reduced sheep grazing.

The Absaroka is criss-crossed by a network of trails, some planned and constructed but most formed by perpetual use. Roads near the Main Boulder and West Boulder rivers and a number of highway spurs in the Yellowstone Valley provide access to trail heads.

The FS established the Absaroka Primitive Area on a 64,000-acre tract near lower Hellroaring, Buffalo Fork and Slough creeks in 1932. The remaining 300,000-odd Absaroka acres received no protection. But the terrain is so rugged and resources so scarce, the land is essentially the same today as it was then. Now, as required by the Wilderness Act, the Absaroka and Beartooth primitive areas and all adjoining wild lands are being reviewed for wilderness classification.

Bob Anderson is working on his doctorate at the University of Michigan, Ann Arbor. He was recently granted a master of science degree in civil engineering (environmental) from Montana State University, Bozeman.

wilderness review

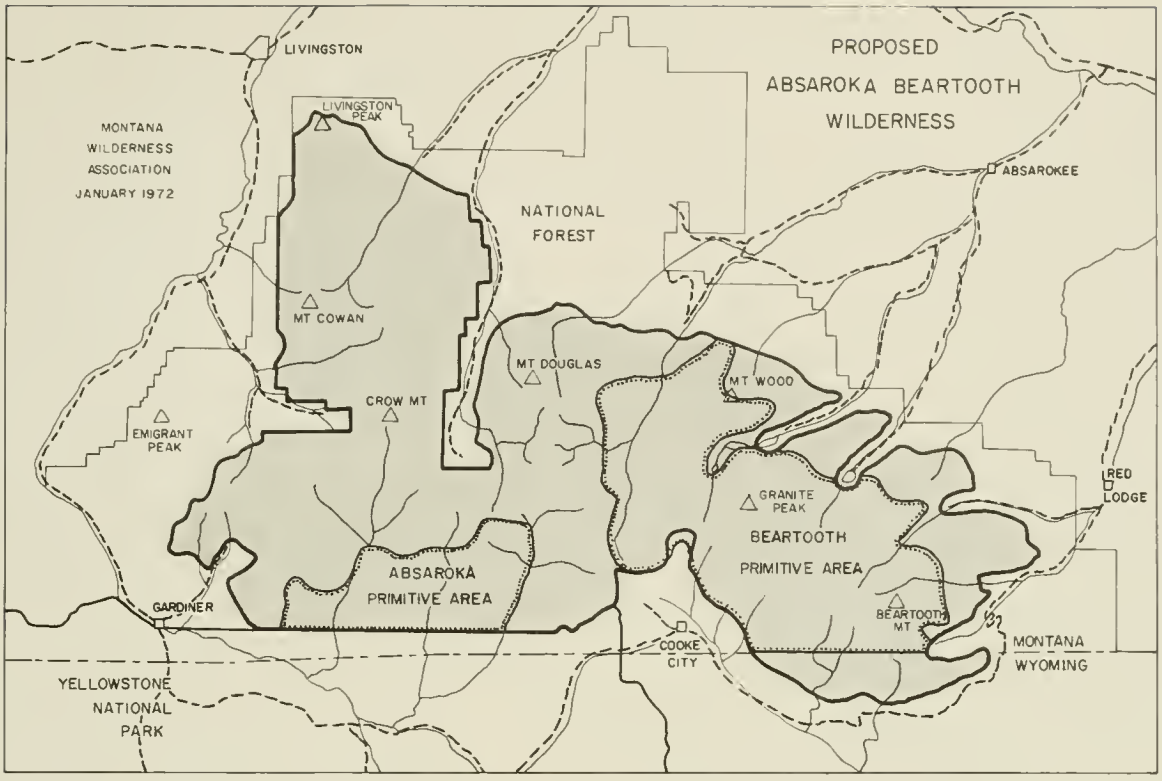
It seems opportune that, just when some development pressure is surfacing, the entire Absaroka area is being reviewed for wilderness protection. Of course, a wilderness study does not merely evaluate the wilderness resource. All resources are inventoried. After the evaluation, the FS will write a recommendation, not based on the area's suitability for wilderness but on the best long-range use of the land, consistent with the multiple-use principle.

True to tradition, the Absaroka primitive area review has uncovered or created resource conflicts. Special interests, whose development opportunities would be restricted or precluded by wilderness designation, have raised objections to such designation.

The local timber industry favors timber development in the existing Absaroka Primitive Area. This development, aided by a massive road-building subsidy, would postpone for several years the imminent shortage of sawlogs in the Livingston vicinity. Wilderness designation would prevent all logging.

The Absaroka also contains small, localized areas of mineralization. Though the Wilderness Act allows mineral exploration until 1984 and mining development on valid claims forever, the mining industry generally opposes wilderness designation. In a classified wilderness, miners must operate under constraints which require them to protect, as much as possible, the wilderness character of the land.

Water developers have traditionally opposed the wilderness concept even though the Wilderness Act allows the President to authorize water development pro-



jects (and power lines, water transmission lines and roads) if the project can be shown to be in the best interest of the public. There are few, if any, potential water impoundment sites in the Absaroka. Water development here would probably be in the form of weather modification or vegetation management to alter snow accumulation and increase run-off.

No apparent conflict exists between wilderness in the Absaroka and grazing. The Wilderness Act allows grazing where it was established prior to wilderness designation.

A major conflict does exist in the Absaroka between wilderness and motorized recreation. Motorized vehicle trails have been developed outside the primitive area. Wilderness designation would prohibit this use, thus depriving motorists of a recreational opportunity.

road, or no road?

But the biggest issue facing government decision-makers and the public is the question of a road corridor. Big Timber, Mont., merchants have proposed that their town be connected to Cooke City, Mont., by a seasonal highway up the Boulder River and through the Slough Creek drainage. Such a road would provide a recreational opportunity for the motorized public and would allow more feasible timber extraction in lower Slough Creek.

Such a road would also produce large but immeasurable costs. The wilderness resource in Slough Creek would be lost forever. Increased access would increase the use-pressure on the already heavily used adjacent wild lands. A large tract of grizzly bear habitat would be destroyed. But most important, the Absaroka would be split from the Beartooth!

This is the most important consideration in the corridor issue. Should the Absaroka be separated from the Beartooth? Both contain magnificent wilderness resources, but how important is it that they remain connected? Ecologically, there are few links between the areas. The connection's importance is based on human use of a wilderness resource, and the human need to escape the intensity of the mechanized world and to experience the wonder and mystery of a great, remote land.

The geological and ecological similarities between the northern Absaroka and the Beartooth have been mentioned. The southern Absaroka is wild land that joins these areas. Together, as one wilderness unit, the Absaroka-Beartooth offers an exceptional array of wilderness options. As determined by preference, whim or weather, one could pursue a wide range of wilderness experiences in an equally wide range of environments. It has valleys with meandering streams, flowering meadows, cascading torrents, small forested lakes, chains of alpine tarns, snowfields and glaciers, quiet forest groves, vast treeless plateaus, rocky slopes, valley cliffs and windswept heights . . . and today's most elusive quality — wilderness solitude.

Both the Absaroka and the Beartooth could stand alone as viable wildernesses. But joined, the total is clearly greater than the sum of the individual parts. The Land of the Bird People asks, in proud silence, to remain whole.

DENNIS
HYDER

THE BLACK BEAR

by Roger Fliger

THE BLACK BEAR, *Ursus americanus,* is probably the most misrepresented of North American wildlife. It's not the hat-wearing Smoky the Bear, the overfed Gentle Ben or the food-begging Yogi Bear of national park highways. Instead, it's a wary animal, a native of the forest rarely seen outside of zoos, television and national parks, and an animal with few natural enemies other than man, grizzlies and other black bears.

The only black bear characteristic more misunderstood than personality is size. Though an occasional adult male may tip the scales at 500 pounds, the average is much closer to 250 pounds. And for an adult female, the figure drops to 125 pounds.

The name, black bear, is also quite misleading since it really comes in many colors, from jet black to cinnamon or tan and various shades in-between. In fact, it's often, but incorrectly, called the brown bear because of these color phases. (There is a brown bear, but not in Montana. The Alaskan brown bear or Kodiak bear is more similar to the grizzly than to the black.) Cubs of different colors often occur in the same litter. But regardless of color, they usually have a triangular patch of white on their chest which remains there into adult life.

Color helps distinguish the black bear from the grizzly, but not completely. Grizzlies have noticeable humps over their front shoulders and wider, dished faces. The black bear has no hump and a longer, thinner nose. Blacks of all ages can climb trees as can young grizzlies. In this part of the country, they share much the same range though black bears are far more numerous. They usually avoid each other, but can sometimes be seen feeding together at garbage dumps.

That's the black bear's one great weakness—food. The animal can't seem to pass up a free meal, a tendency that often gets it in trouble. To the black bear, campgrounds, garbage dumps, food stored in camp tents, bee hives, domestic stock and orchards are all potential food. Although primarily a vegetarian, the black bear is officially classed as "omnivorous," it will eat almost anything—animal or vegetable. It favors thick brush and timber where its favorite food, fruit and berries, can be found, but at times, particularly in the spring, it can be seen grazing on open hills and snowslides.

lifestyle

With the possible exception of the muskox (a stocky, shaggy, oxen-like herbivore found in nor-

Since the species has several color phases, the name "black" bear is often misleading. For example, this very black female has given birth to a very brown cub. (F&G photo by Bill Schneider)

A reproduction of an original oil painting by Dennis D. Hyder.

THE BLACK BEAR continued

thern Canada), bears, in general, have the lowest reproductive rate of any North American land mammal.

Mating begins after the bears emerge from their dens in the spring of the year. The mating season peaks from mid-June until mid-July but may continue into August.

The young are born during the denning period in mid-winter. Multiple births are common (average litter—1.6 cubs), and the newborn cubs usually weigh from 8 to 12 ounces.

One interesting result of the black bear study at Big Creek (conducted by Fish and Game in the Whitefish range from 1956 to 1966) was the age of the female bears producing young. No females were successful in raising litters before 6 1/2 and 7 1/2 years of age. While the female can have litters every year, often they skip two or even three years. This low reproductive rate is adequate, partly because of the competence of the mothers in protecting their young and partly because of the precocious (early maturing) nature of the cubs. Even at 6 months, they are capable foragers and fighters. Usually, cubs are weaned when 7 months old.

The only long-lasting group relationship exists between the female and her cubs. They are constantly associated during their first summer, and they den together, closely huddled, the next winter. This relationship continues well into their second summer. The family group usually breaks up (after 1 1/2 years) at the start of the breeding season in June. The separation, signalled by aggression toward the young by adult males, means the cubs (now subadults) are on their own and much more vulnerable than ever before.

Black bears don't form groups outside the family group, but they live in close contact with other bears. They are territorial, but carry on relations with other bears in a given area. On a local scale, individual bears move about quite freely, but they are

Distribution of the black bear in Montana

prevented, apparently by territorial pressure, from moving many miles in any direction outside their home range.

"Home range" refers to an area in which an individual spends the greatest portion of its time. Most mammals make occasional trips outside this area, but not frequently.

Adult males in the Big Creek area had home ranges of about 12 square miles while females frequented areas much smaller, about 2 square miles. The ranges of adult males and females overlapped, but there was little overlap between adults of the same sex. In many cases, subadults remained in their mother's home range after the family had broken up.

winter sleepers

Black bears "den up" during winter. Technically, they do not hibernate; they "winter sleep." Whereas true hibernators are only awake a fraction of the winter, black bears seem to be awake most of the time.

Some of their behavior, such as curling and den-building, is similar to that of true hibernators, but most of the denning behavior observed during the Big Creek study indicated winter was rather like an extended waiting period for the bears. They were easily aroused and often quite active in the den.

Many choose the base of a hollow tree as a denning site. Others settle down under fallen logs, in abandoned mine shafts, in rock caves, under cabins or in underground dens dug or enlarged by the bear. All make hollows in which to lie, and some drag nest materials (dry leaves and tree bark) into the den. It has been suggested, however, that only females improve the den. Males usually den later in the fall when nest material is less available. Few black bears block the den entrance with nesting material in the manner of true hibernators.

black bears as big game

People often have preconceived ideas about the black bear as a big game animal, failing to realize there's little resemblance between the "wild" bear and the one common to parks, zoos and cartoons. Many hunters consider it the wiliest of all the big game animals.

A bear senses danger almost as readily as food which means a sportsman must take full advantage of the wind. Like its sense of smell, its hearing is keen, and though not excellent, its eyesight is good enough to spot a careless hunter.

To prepare for their winter sleep, black bears spend autumn eating to store up fat. That means hunters, interested in a trophy, should also frequent areas where ripened berries and fruits are abundant.

In early days, the black bear was considered a predatory animal. It was shot, trapped or poisoned indiscriminately wherever and whenever it could be found. Most of the sport hunting for black bear was accidental or incidental to other forms of hunting. But in recent years, black bear hunting has taken on a new dimension.

Today, the black bear is considered a trophy animal which means, legally, only the hide need be removed. (Use of meat is not required.) The black bear season lasts longer than that of any Montana big game animal except the mountain lion.

Roger Fliger is the department's regional coordinator in Billings.

Much of the management of the black bear came as a result of the Big Creek study. After one year of trapping, tagging and releasing bears, it was found only three per cent of the tagged animals were harvested by hunters. As a result, a more liberal season was begun.

after the hunt

Since the first summer black bear season in 1959, the harvest has been increased to include a statewide spring hunt.

After taking the bear, it should be skinned as soon as possible—the pelt comes off easier and the meat cools more rapidly. Remove as much fat and flesh from the hide as possible, salt it and stretch it out in the shade.

After the salt is changed several times, the hide can be rolled up and placed in a gunny sack. A fresh, unsalted hide should never be rolled up and put in a plastic bag; that almost guarantees the fur will slip, ruining the trophy.

Bear meat is fine eating and the rendered-out fat makes a lard that can't be beat for biscuits. Bear grease is also famous for softening and water-proofing leather boots.

People who have only viewed bears in zoos, national parks and campgrounds probably think it unsportsman-like to shoot a black bear. However, the person who has tracked one for miles in freshly fallen snow only to have it pull its "disappearance into the brush" act will certainly consider the black bear worthy game. In fact, in fair chase, without bait or vehicles, a hunter alone is rarely a match for *Ursus americanus*, the black bear.

dear F&G

SUPPORTS TIGHT CONTROLS ON COAL

A few comments and questions concerning your Montana Coal—Part One article, and the question of strip mining in eastern Montana are in order.

First, a few facts about myself to put my remarks in perspective. I am a member of the Sierra Club, National Wildlife Federation and the National Audubon Society. Our family vacations frequently in Montana. My daughter is a freshman at the University of Montana. Although many of our friends who travel west find the country from the Missouri west to the Rockies dull and uninteresting. I enjoy traveling through it and find it scenic and compelling in its own right.

I strongly urge all Montanans to take an interest in coal strip mining in eastern Montana and to see that strong legislation and enforcement prevent or minimize the environmental degradation associated with strip mining. I also urge them to prevent or minimize the construction of coal-fired power generation plants and transmission lines in Montana. Electrical energy transmission is very inefficient; let the coal be shipped out, not the generated electricity.

With proper regulation and control, Montana's coal resource would seem to present some kind of an opportunity for Montanans while providing needed low-sulfur coal for energy production. Must coal mining disrupt a large part of eastern Montana? Your article would indicate not, as on page 15 you cite present coal production of 16 million tons annually disturbing 275-500 acres, also annually. This is a statistically insignificant area compared to the millions of acres of eastern Montana. So limit the amount of mining and enforce land reclamation of strip mined areas.

I would also like to point out that Northern States Power Co., the largest in the upper midwest, has not advertised for power consumption for several years and, in fact, gears their ads to power conservation.

I enjoy your publication very much and think it is getting better with every issue, particularly when hunting and fishing articles are not the only ones featured.

James C. Landkamer
White Bear Lake, MN

LIKED EDITORIAL

Mr. Brown's editorial on landowner/hunter relations was most timely. It has been my experience that as a farmer, you don't have any problems with the fellow that has time to knock on your door and ask to hunt or fish. It's the guy that stops up the road, usually out of sight of your house, and goes in uninvited that shoots your cows and destroys your property in general.

I think the landowner is entitled to that small consideration. After all, he is paying the taxes (in most instances, plenty), and the fact still remains, the land belongs to him. I still feel the real sportsman is gentleman enough to ask, and I have always been glad to have these kind of fellows on my land to hunt or fish. And also to have them for friends.

At the rate the hunting and fishing privileges are diminishing, some of the so-called sportsmen had better ask themselves, "What's the reason? What had I better do?"

I can tell him what he'd better do. He'd better shape up and insert a few manners and consideration into his being — and soon — or what few areas there are left will be closed to him, too. Some of the childish, dangerous stunts some of these clowns pull are sickening and I might add, in many instances, very dangerous.

Allen Scollard
Manhattan, MT

WHAT HAPPENED?

What has happened to the quality of MONTANA OUTDOORS? Why aren't you mentioning the "Editorial Creed" any longer? Why is MONTANA OUTDOORS being printed on very cheap paper? What has happened to the quality printing and interesting pictures on the front and back of MONTANA OUTDOORS?

The last quality copy of MONTANA OUTDOORS was July/August. Since then we have had to put up with a very inferior product.

Look at the July/August 1972 issue and preceding issues. Notice the quality of the front cover print. Notice the quality of the front and back cover pictures. Notice the quality in the feel of the paper.

Almost everyone I have talked with about this cheap printing and use of poor quality paper is asking the same questions. We consider MONTANA OUTDOORS a reflection of Montana's quality and pride in being. The last few copies have been an insult to image.

I feel you can and should do something to bring back the quality of our magazine. If operating costs are truly the reason for this degradation, then I am in favor of raising the subscription rate. If management is the cause of this degradation, then I am in favor of seeking management that has an interest in the true image of Montana as should be reflected in Montana's personal publication, MONTANA OUTDOORS.

James R. Duke
Laurel, MT

● *A financial cut-back was a fact-of-life for us last summer. Since then, the magazine has steadily improved. Now, it has reached a point of equal or higher quality, in our opinion.*

Although not specifically labeled as such, our editorial creed appears on page 1 of every issue. We still publish under the dictates of this theme.

The paper we presently use costs us less, but it isn't "cheap." It's different because it has a dull finish as opposed to a glossy paper we used until September 1972.

We've discussed a subscription rate hike, but have not made a final decision. There is much more here than meets the eye. MO is a public service to be provided at the smallest possible cost to our readers.

A BAD SCENE

In your September/October 1972 issue of MONTANA OUTDOORS, an article appeared named, "A Call to Action." This article pointed out how the hunter's image is fading away and at the article's conclusion, a plea for hunters to improve their image appeared. It also stated that this improvement was imperative for hunting to survive as a sport for all to enjoy.

Recently, I had the misfortune to see what I consider a threat to hunt-

recycled paper

dear FG

ing. The scene was an alley garbage can, the subjects, 10 mallard ducks. The ducks were untouched and appeared to have absolutely nothing wrong with them. Why do some sportsmen (?) insist on hunting, taking the limit and not utilizing their successes? I can think of many needy people who would give anything to have roast duck. I would suppose that even charities would take the ducks. Evidently, this sportsman (?) had another thing in mind, the garbage can.

It would seem to me, that if hunt-

ers wanted to improve their image, they would hunt for their needs and enjoy their successes rather than killing just for the pleasure of killing. I am a hunter and enjoy the sport both for its experience and its benefits that show up on the dinner table. I consider it a threat to hunting, hunting's principles and a hunter's image, to see hunters (?) kill needlessly and wastefully. If you don't like to eat it, don't hunt it.

Robert L. Chatriend
Montana State University
Bozeman, MT

RECYCLING IN BILLINGS

In regards to Mollie O'Kane's letter on recycling, I agree with her 100 per cent. When I was in Billings, I drew up a set of plans for a recycling center. I took them to a certain person, who I am not mentioning, and showed and explained the idea to him. He made the remark, "You are five years too early." I told him in five years, Billings will need several centers because it will be in such a mess, the city will never get out of it.

I found out the closest place to take cans, bottles, newspapers, etc. is in Cody, Wyo. He remarked, "It would cost too much to send it to Cody. We couldn't afford it."

Which costs more? To have the country cleaned up or to send recyclable materials to Cody? It costs about $5 million a year to clean up our country. It surely wouldn't cost that much to send the cans to Cody.

What could be done is this: have all recyclable material gathered together, then have Army trucks take it to Cody. I am sure the Army would be glad to do it for nothing.

Richard L. Conner
Wolf Point, MT

AND THAT'S WHY I LIKE THE MAGAZINE

I am at my cottage right now. My cottage is on the St. Clair River and I fish alot and catch alot. My Dad takes out our boat and catches walleye. But my Dad calls me the fisherman. And I am very interested in fishing and all sports. And thats why I want the magazine.

Jay Hirt
Mt. Clemens, MI

KEEP HEAVY INDUSTRY AT HOME

The editorial in the Jan/Feb issue on the strip mining and power development in southeastern Montana summarizes the situation very well, I thought.

It is ironical to me that the U. S. and the large industrial corporations have for many years been telling the so-called undeveloped countries of the world, "Let us develop your natural resources and your standard of living will improve, etc.," of course with resultant profits to the developers. Now we in Montana are attempting to isolate ourselves from the rest of the continental states by at least a moratorium.

It is also somewhat ironical that we say, "Tourism is OK, light industry is OK, but keep your heavy industry at home." This is isolationism and will not work, in my opinion. Firstly, the country cannot be as hard hit economically as I think it is if so many states can continue in financial health on a tourism basis; secondly, I seriously doubt if the state can provide jobs for its youth on a tourism basis and light industry. Light industry would be fine, but how much is moving into the state and how many employees does it require?

There are, of course, many angles to the problem, and all Montanans will not be pleased with all of the decisions and laws affecting the problem, I am sure. We hear much rhetoric and many figures. The only one that knows what the figures really mean is the person that compiled them.

Charles P. Harmon
Billings, MT

MAKING A BETTER PLACE TO LIVE

I was really impressed by your January/February issue of MONTANA OUTDOORS. My state is also in the midst of a "black gold" development crisis. The only difference is that in Alaska the "black gold" is petroleum and natural gas reserves. not coal.

It is encouraging to see you take such a strong stand and place such a high value on "living land." It seems to me people look to a Department of Fish and Game for leadership in providing and maintaining quality outdoor recreation opportunities.

It is refreshing to see you providing just that kind of leadership. I am sure that Montana will become a better place to live as a result of your efforts.

John N. Trent
Ester, AK

NO RERUN, PLEASE

I appreciated your article in the Jan/Feb 1973 issue on strip mining. I grew up in the Pennsylvania coal fields and saw 20 years of strip mining before I came west.

I hope we don't see a rerun of eastern strip mining practices. To control these men and machines, it will take the best that is in all those who are opposed.

I want to volunteer my services and help in any way possible to save Montana from the "pit."

Please keep us informed what we can do to help arouse our fellow men against this evil scourge.

James Feracioly,
Field Representative
Northwest Indian Bible School
Alberton, MT

SINGING PRAISES

We've spent the last several weeks singing the praises of the strip mining article in the Jan/Feb 1973 issue. The article is well researched and much needed. We look forward to the next installment.

Mavis McKelvey, Cochairman
Montana League of
Conservation Voters
Missoula, MT

ANOTHER COMPOSTING IDEA

Your readers might be interested in the composting method which has proved successful for me.

In a large wooden box, or trash can, with small drainage holes in the bottom and supported off the floor, fill two-thirds with earth and a little manure. Add 1,000 to 5,000 red wriggler worms (earthworms will not convert garbage) and wait a few months for worms to recover and begin to breed. Garbage should be chopped fine or run through a blender before burying in the dirt. If the worms are well fed, warm, damp and dark, they will multiply quickly and reduce garbage within a few days to compost. There is no odor, as long as the garbage is covered with some of the dirt. Each spring take out half of the rich compost and spread on the garden, add more earth to the box and begin again. I keep my box in the house in the utility room, and visitors are completely unaware that in the burlap-covered plywood box, little red worms are converting garbage to compost.

Phyllis Falconer
Trego, MT

THANKS TO LANDOWNERS

I don't know that you have a way to do this, but if there were some way to thank the ranchers in the Wisdom area for the opportunity to fish the Big Hole and its tributaries from their land, I would certainly appreciate it. That accessibility guaranteed us some fine fishing and a wonderful vacation. We tried to leave the land as clean as we found it, and it looked like most of those who fish it do the same.

C. G. Rowe
Seattle, WA

a way to the wilderness

If you and your hiking boots are just getting acquainted, the Wilderness Society has a trip for you. If you're already a white-water enthusiast, there's a trip designed to meet your demands.

The Wilderness Society is sponsoring 76 trips, beginning in March and extending into October. These outings will consist of horseback, hiking with packstock, canoe and raft trips. According to program director Bob Cooney, "The trip adventure program is being conducted especially to aid in the enjoyment and appreciation of wilderness."

Length of the trips varies from four to twelve days. To lessen environmental impact, the number of guests is limited. The trips usually fill up rapidly, so interested persons are asked to register early.

A brochure, which includes an application form and details about individual trips, is available from: Trip Department, The Wilderness Society, Western Regional Office, 4260 East Evans Avenue; Denver, Colorado 80222. Trips scheduled for Montana and nearby areas are listed below.

LINCOLN-SCAPEGOAT WILDERNESS—July 13-22; July 27-August 5. From Helena, Montana. Wild Country Outfitters, outfitter. $355. (horseback)

BOB MARSHALL WILDERNESS — July 16-27; July 30-August 10. From Missoula, Montana. White Tail Ranch, outfitter. $385. (horseback)

WEMINUCHE WILDERNESS — July 17-24; July 31-August 7. From Wagon Wheel Gap, Colorado. Bibs Wyley, outfitter. $275. (horseback)

SELWAY-BITTERROOT WILDERNESS—July 23-August 2. From Missoula, Montana. Jack Wemple, outfitter. $375. (horseback)

BANFF NATIONAL PARK WILDERNESS—July 27-August 2; August 4-10. From Banff, Alberta, Canada. Bud Brewster, outfitter. $220. (horseback)

YELLOWSTONE WILDERNESS—August 2-13; August 16-27. From Jackson, Wyoming. George Clover, outfitter, $385. (horseback)

ABSAROKA WILDERNESS — August 4-13; August 17-26. From Billings, Montana. Duane Neal, outfitter. $360. (horseback)

FLATHEAD WILDERNESS — August 10-19. From Great Falls, Montana. Chuck Blixrud, outfitter. $335. (horseback)

SAN JUAN-RIO GRANDE WILDERNESS—August 14-25; September 24-October 1. From Durango, Colorado. Bill Crader, outfitter. $385, $280, respectively. (horseback)

LINCOLN-SCAPEGOAT WILDERNESS—June 30-July 7. From Helena, Montana. Don Merritt, outfitter. $230. (hiking with packstock)

GROS VENTRE WILDERNESS—July 8-17. From Jackson, Wyoming. L. D. Frome, outfitter. $265. (hiking with packstock)

TETON WILDERNESS—July 19-28. From Jackson, Wyoming. L. D. Frome, outfitter. $265. (hiking with packstock)

WEMINUCHE WILDERNESS — July 22-29. From Creede, Colorado. Charles Kipp, outfitter. $230. (hiking with packstock)

MISSION MOUNTAINS WILDERNESS—July 23-30; August 3-10. From Missoula, Montana. Bud Cheff, outfitter. $230. (hiking with packstock)

WASHAKIE WILDERNESS—July 30-August 9. From Jackson, Wyoming. L. D. Frome, outfitter. $290. (hiking with packstock)

LA GARITA WILDERNESS—July 4-11. From Wagon Wheel Gap, Colorado. Bibs Wyley, outfitter. $230. (hiking with packstock)

SELWAY-BITTERROOT WILDERNESS August 7-15; August 18-26. From Missoula, Montana. Jack Wemple, outfitter. $235. (hiking with packstock)

YELLOWSTONE WILDERNESS—August 12-21; August 24-September 2. From Jackson, Wyoming. L. D. Frome, outfitter. $265. (hiking with packstock)

LONE PEAK WILDERNESS — July 17-21; August 26-30. From Salt Lake City, Utah. Peace & Quiet, outfitter. $125. (backpacking)

GORE RANGE-EAGLES NEST WILDERNESS—July 19-25. From Vail, Colorado. Adventure Associates!, outfitter. $205. (backpacking)

JEWEL BASIN WILDERNESS—July 24-31. From Kalispell, Montana. Don Merritt, outfitter, $140. (backpacking)

SAWTOOTH WILDERNESS—July 29-August 4. From Sun Valley, Idaho. Wilderness Encounters, outfitter. $205. (backpacking)

WEST ELK WILDERNESS—July 31-August 6. From Gunnison, Colorado. Adventure Associates!, outfitter. $225. (backpacking)

HOLY CROSS WILDERNESS—August 12-18. From Vail, Colorado. Adventure Associates!, outfitter. $205. (backpacking)

HELLS CANYON WILDERNESS — June 10-15; September 2-7. From Boise, Idaho. Wilderness Encounters, outfitter. $280. (water trip)

NORTH PLATTE WILDERNESS — June 11-14. From Laramie, Wyoming. Richard's River Trips, outfitter. $120. (water trip)

MISSOURI RIVER WILDERNESS—June 22-28. From Havre, Montana. Nick LaFrantz, outfitter. $280. (water trip)

SALMON RIVER WILDERNESS — August 5-10. From Salmon, Idaho. Wilderness Encounters, outfitters. $280. (water trip)

CANYONLANDS CANOE WILDERNESS—September 5-11. From Green River, Utah. Adventure Associates!, outfitter. $265. (water trip)

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FOR THE YOUNG HUNTER by John Madson and Ed Kozicky, published by the Conservation Department of Olin Mathieson Chemical Corp., East Alton, Ill., 1963, booklet, 32 pages, no price listed.

"If there is one word that might sum up the hunting ethic, it is respect. Respect for your companions, the land, the wildlife you hunt and for yourself. This respect may almost border on reverence and, lacking it, a boy can never hope to become more than half a hunter." These words are part of the last paragraph in *For the Young Hunter* and summarize the booklet's eight short essays.

This booklet should be required reading for all young hunters—in fact for all hunters, young or old. Even if a person has never hunted or never intends to hunt, time spent reading this book would not be wasted. The character traits that make a good hunter and sportsman also make a good citizen.

The booklet is written in a very readable style and the lessons contained in it would enrich anyone's life. The essays cover everything from the choice of hunting companions to the care of your dog, your equipment and yourself. The authors bring out some interesting thoughts on wildlife conservation and the reason people hunt. Important points on the safe handling of firearms are stressed. Read it—you'll like it! —*Joyce MacDuffie*

THE POLITICS OF POLLUTION by J. Clarence Davies III, Pegasus, New York, 1970, 231 pages, $6.00.

The Politics of Pollution is thought-provoking; it defines pollution as a concept of human use. Therefore, what is defined as pollution depends on how the public wants to use its environment.

Davies explains that the degree of pollution becomes a political decision —the community's statement of public interest. He maintains this is the only way pollution can be understood by policy makers since nature alone has many processes that would be considered pollution from the human-use standpoint.

The book looks at pollution control in terms of three stages: "wants," "demands" and "decisions." A "want" is a perceived dissatisfaction which, in most cases, doesn't lead to political action. A "demand" is voiced dissatisfaction, demanding government action for alleviation, and "decision" is the action or lack of action taken by government. The book then shows the various routes by which things are caused to "happen." Case histories are given and suggestions made about how people can be sure of getting their feelings into the action process.

In the end, Davies boils pollution control down to the importance given it by the political system. He states it is a question of money and political power and rates power the most important. *The Politics of Pollution* would be a handy reference book for anyone interested in doing more than just thinking about environmental problems.—*Bob Carroll*

SPORT FISHING U.S.A. edited by Dan Saults and Michael Walker, U.S. Dept. of Interior, Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, for sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, 464 pages, $10.

Any fisherman, fresh or saltwater, serious or once-a-year, or non-fisherman with an interest in aquatic biology can benefit from the novel approach given fishes and their management. Although the book is published by the Bureau of Sport Fisheries and Wildlife, many of the contributing authors are from outside the agency.

Each section is authored by persons chosen for their special knowledge. This gives each new subject a new approach and creates new interest in each. Sections of little interest to a reader can be by-passed or picked up at a later time.

The photography is excellent and complements the copy; numerous cartoons give the book life. *Sport Fishing U.S.A.* covers everything from the fish themselves, techniques of fishing and fisheries management to why people fish. The economics of fishing are discussed as well as tempting recipes for the gourmet.—*Otis Robbins*

THE VENISON BOOK: HOW TO DRESS, CUT UP AND COOK YOUR DEER by Audrey Alley Gorton, The Stephen Greene Press, Brattleboro, Vt., 78 pages , paperback, $1.95.

The author wrote this helpful little book around the central theme "venison is good; don't apologize for it." It's a clear, crisp and entertaining guide to bringing down a deer and getting it to a butcher, freezer or table in prime condition.

The author covers all the essentials —shooting, field dressing, transportation, skinning, butchering, preservation and cooking. She gives the how's and why's for every step from the woods to the table.

And just to make sure your dinner won't be a flop, she also included a chapter on dishes to complement the main course.

I consider this book a handy item for the man who just took up hunting —or for his wife.—*Cecelia Huls*

DECORATING WITH PLANT CRAFTS AND NATURAL MATERIALS by Phyllis Pautz, Doubleday & Company, Inc., 1971, 239 pages, $8.95.

I just finished reading *Decorating With Plant Crafts and Natural Materials* and feel as though I should rush out and start decorating. The book is inspiring, to say the least.

Phyllis Pautz covers nearly every natural material and gives loads of decorating ideas for these materials —and then tells you how to make them! The book includes easy instructions for everything from pomander balls and pine cone wreaths to hanging herb gardens.

It contains a personal reading list for those who want to know more about a particular craft and many instructional drawings, together with full-color photographs that would make BETTER HOMES AND GARDENS drool.

The book is slightly expensive for a "how to do it" venture, but I think it is well worth the money. It would make an excellent gift for the woman

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with an eye for home decoration. Or treat yourself, and create an interest center in a dull corner of your home. —*Cecelia Huls*

WINTER OF THE SLEEPING GIANTS Glacier National Park by William and Lynda Shiffman, Shiffman & Shiffman Enterprises, 305 O'Connell Drive, Lolo, MT 59847, 64 pages, paperback, $2.98.

The authors obviously have a deep love for the scenery and natural marvels found throughout Glacier National Park. Their preference is winter, but they can't hide the year-round attraction for this unique and awe-inspiring wilderness.

Also, they know of a common Montana description of Glacier Park that goes something like, "This is where God chose to live while he was making the rest of the world." The book is filled with appropriate passages from the Bible.

Unfortunately, they haven't expressed their great love for this great land with great ability. Both the photography and narrative can be easily topped.

The color photos, all 37 of them, aren't the work of a professional photographer. And the writing, although their extra effort shows through, can't be championed. Sometimes they lose themselves and the meaning in an effort to be arty or semi-poetic.

Although the subject matter is certainly among the worthiest found anywhere, the authors just didn't do justice to it. — *Bill Schneider*

THE BIRDS OF PREY by Glenys and Derek Lloyd, illus. by Ken Lilly, Grosset and Dunlap, 159 pages, $3.95.

This is a delightful and engaging book for both the amateur and the experienced ornithologist. Although chiefly written for the layman, the professional biologist may be attracted to sections on feeding and sexual dimorphism, where new theories and new discoveries are discussed.

Much academic interest by the scientist as well as romantic appeal has always been attached to those feathered raptors of the day, the hawks and the eagles, and their silent night-time replacements, the owls. In this beautifully illustrated book, which includes 220 full-color drawings, you will find plentiful information on how birds of prey hunt, mate, raise their young and migrate. The authors also guide the reader through the intricate patterns involved in falconry.

The Birds of Prey gives the reader a unique inside look at the private world of the soaring hunters of the sky. The eye of the scientist and the skill of the artist collaborate to fill page after page with interesting information for every nature enthusiast. As a biologist trained in the discipline of ornithology, I was impressed with the systematic approach used by the authors in presenting the birds' life histories. This is a book that is well worth adding to your library.—*Ken Walcheck*

BOOKS RECEIVED

—reviewed in brief—

INTRODUCTION TO FOOT TRAILS IN AMERICA by Robert Colwell, Stackpole Books, Harrisburg, Pa., 1972, 221 pages, $5.95.

Introduction to Foot Trails locates and describes one-day, overnight and week-long hikes within easy driving distance of more than 100 major cities in America. Also included is a trail rating system, based on challenge, shelter, water, scenery and closeness to medical aid.

CAMPING IN COMFORT by Norman and Sil Strung, Lippincott Co., Philadelphia, 1971, 262 pages, no price listed.

This complete, illustrated guide tells how to go camping with a minimum of effort. For the beginner, the authors include hundreds of tips on the best way to do just about everything while you're camping.

THE NEW HUNTER'S ENCYCLOPEDIA, Third Edition, Stackpole Books, Harrisburg, Pa., 1966, 1154 pages, $24.95.

This book covers everything about hunting a hunter would want to know, but it's too bulky to take to the field with you. It covers all U. S. and Canadian game birds and animals and the successful ways to hunt them, the kinds of guns and ammunition to use, the standard breeds of hunting dogs, camping and hunting equipment, conservation projects and safety—in short, just about everything connected with the sport of hunting.

ONE ACRE AND SECURITY by Bradford Angier, Stackpole Books, Harrisburg, Pa., 1972, 319 pages, $6.95.

The author says his book is written for people who want to move, not into the wilderness, but far enough from society to raise their own meat, catch their own fish and plant their own garden. Angier's book is filled with how-to-do-it's and easy-to-follow diagrams on everything from building a cabin to chopping logs.

THE HUNTER'S ALMANAC by Norman Strung, Macmillan Co., New York, 206 pages, no price listed.

This book is a digest of facts and hunting tips that covers every species of game in North America. And it includes charts that will tell you which states offer the best hunting for your particular animal during any time of year. Game animals are divided into four categories and each begins with an article on general techniques and equipment best used for that type of hunting.

wildlife shorts

At birth, the opossum is no larger than a honey bee.

* * *

Lady bugs hibernate for the winter, instead of dying like many other insects.

* * *

The wolverine is the only mammal that is never inflicted with arthritis.

A bat can distinguish its own cries from similar vocalizations of thousands of other bats in the same cave and uses its echo for navigation.

* * *

The ant can lift a weight many times the mass of its own body.

* * *

A three-toed sloth may spend its entire life in one tree.

Of the 796 species of birds in North America, only 74 are hunted.

* * *

The caribou is the only member of the deer family where both sexes have antlers.

* * *

No one knows why, but the wrybill plover is the only bird with a disjointed beak, and it is always bent to the right.

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CLASSROOM CONSERVATION

BASIC CONSERVATION FOR THE YOUNG CONSERVATIONIST

PROTECTIVE COLORATION

PREDATION — ONE ANIMAL killing another for food — is a way of life in the outdoor world. Some animals play a dual role—sometimes hunter and sometimes hunted. And others live in constant fear of death. To protect themselves, many animals have evolved defense mechanisms of various types including speed, the use of claws, quills and unpleasant odor.

Those animals too weak to fight off attackers and too slow to escape enemies are left with another defense—camouflage (protective coloration) — that enables them to blend with their environment.

Camouflage also means disguise for the purpose of deception. That is why many animals are "invisible" to their predators although they're not attempting to hide.

There are a number of ways an animal uses protective coloration to escape enemies. An animal's color that matches its surroundings reduces contrast and makes the animal difficult to see.

Most wild animals resemble their surroundings; deer, coyote, grouse are common examples.

The bittern, a marsh heron, is colored like the reeds in which it makes its home. To protect itself when danger approaches, not only will the bittern stand erect with its beak pointing skyward, but if a breeze blows the reeds, the animal will also sway its body with the reeds.

Another means of camouflage is countershading which makes an animal appear flatter than it really is and makes it hard to see from several directions. Many birds, frogs, fishes and turtles are camouflaged this way.

Countershading makes the part of the animal exposed to light darker than the part away from the light. The dark back of a fish blends with the dark bottom of a stream or lake, and the lighter belly of a fish matches the surface and the lighter sky above. Looking down into the water, the dark back of a fish is barely visible. Looking up, one might not see the fish near the surface because of its light underside.

A partial disguise is often as effective as being completely camouflaged. The hornworm, when alerted to danger, will rear back, exposing two large colored spots on its back that look like eyes. The purpose of these "eyes" is to startle small enemies and hopefully drive larger attackers away from this "strange" new animal.

Students are reminded that entries for the Earth Day Contest should be mailed no later than May 31st. To assure the most effective, complete project, we suggest that students start well in advance of Earth Day, April 22nd. Mail entries to MONTANA OUTDOORS, Department of Fish and Game, Helena, MT 59601. The winner(s) will receive a free, one-year subscription to MONTANA OUTDOORS in addition to having their name(s) and a description of their winning project published in the magazine. (Refer to the Jan/Feb 1973 issue of MONTANA OUTDOORS for details on the contest.)

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Because it is protectively disguised in the underbrush, the fawn is able to conceal itself from approaching predators.

Some of the most interesting wearers of protective coloration are those animals that change colors as they move from one background to another. These animals are usually able to change their colors quickly to blend with their environment. A good example is the chameleon.

When walking on green leaves, the chameleon quickly changes to the color of the leaves and will turn brown as soon as it crosses an area covered with brown soil.

A tree frog will hide on a tree all day, protected by its irregular patches of color and its bark-colored skin. When protected by darkness, it will freely hop around searching for food.

The skin of a horned lizard is knobby and colored like grains of sand. In addition, they have saw-toothed spines along their body to break up the contour. When still, these lizards "disappear" by flattening themselves to the ground.

Many birds also use protective coloration. The male members of various pheasant species have remarkably bright color patterns while the female pheasants, in comparison, are well camouflaged with a dull color. This drab coloration helps protect the females from predators.

The snowshoe rabbit is a good example of seasonal coloration. These rabbits have grayish-brown fur in the summer, making them almost indistinguishable from the underbrush. Late in the fall, they undergo a transformation, and white fur grows in with the darker fur, making them blend well with the snowfall at that time of year.

By the time heavy snow falls, the rabbit has completed its color change and is completely white, with the exception of a few darker spots. Since the snowshoe rabbit is active throughout the year, it is easy to see how protective coloration helps the animal survive.

Sometimes, those animals without a defense rely on their resemblance to another dangerous or distasteful animal for safety. These animals are called mimics, and an excellent example is the Viceroy butterfly. The Viceroy has virtually no enemies because it looks exactly like the distasteful

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PROTECTIVE COLORATION continued

Monarch butterfly, and any bird that has tasted the Monarch will look elsewhere for a meal thereafter.

Very few animals eat ants, primarily because they emit a distasteful fluid. Therefore, smaller insects like beetles and spiders sometimes evolve physical characteristics that make them look like ants. Only when these insects are in their developing stages are they able to imitate the appearance of an ant. As they grow, they will develop characteristics similar to another larger insect for protection.

A yellow-jacket wasp, with its distinctive yellow and black pattern, clearly warns predators of its identity and its dangerous stinger. To protect themselves, many flies, beetles and moths have also developed the same wasp-like appearance.

Mimicry needn't involve only resemblance of animals to each other, but extends to animals that resemble leaves, twigs, bird droppings, dewdrops, blades of grass and seeds.

The praying mantis, for one, looks like a twig. Another is the stick caterpillar. When danger approaches, the caterpillar grabs the branch it is crawling on with its hind legs and lets go with its front legs, thrusting itself out from the branch at an angle. With its bark-textured skin, it fools many predators into believing it is a twig. . .

Many butterflies can disappear by folding their wings and sitting in the foliage they resemble. The dead leaf butterfly not only has wings that are shaped like twigs, but the markings on the underside of the wings imitate a leaf's veins.

Camouflage, causing evolutionary changes that enable animals to protect themselves, is only one defense mechanism that helps preserve life in our environment.

No matter how well equipped an animal might be to protect itself, it still must take chances to survive. And although one individual's life may be short, the species lives on. *Toni Jensen*

NATIONAL WILDLIFE WEEK

Plans are being readied by thousands of local and state groups across the country for participation in the 36th annual National Wildlife Week, set for March 18-24.

The theme of the 1973 Wildlife Week, sponsored each year by the 3.5 million-member National Wildlife Federation and its state affiliates, is "DISCOVER WILDLIFE—It's Too Good To Miss." Focus of the week will be on the simple, yet exciting, joys that can be found by Americans of all ages in the outdoor world.

The executive vice president of the NWF, Thomas L. Kimball, commented on the Wildlife Week's poster symbol, a young wood duck shown just emerging from its nest. "All that newly-hatched duck has to do to break out into the natural world is take that first step out of the nest," Kimball said. "And it's nearly as easy for people to take that same step, to break out into nature and see what beauty it has to offer."

During this year's Wildlife Week, Kimball urges that families "get out and enjoy our wild resources. The experience can open up an entirely new world."

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PULL A PLUG FOR WILDLIFE

EDITOR'S NOTE: The rate at which we consume electrical energy, and the way we produce it, directly affects our environment. And it appears the environmental price we'll pay may be exceedingly high: extensive strip mining of coal, water pollution from those power plants and transmission lines through wilderness areas. All that means less fish and wildlife habitat and, in turn, less fish and wildlife.

THE AMERICAN HOME is bulging with electronic appliances. They can be found in every room of the house, from the electric toothbrush and water pik in the bathroom to a can opener and ice crusher in the kitchen. Electronic gadgets have infiltrated the American way of life to such an extent, the American housewife thinks she can't be without.

These appliances are part of a lifestyle that is sucking up the world's energy resources at a rate that staggers the imagination. Though the American people represent less than 5.7 per cent of

BY CECELIA HULS

PULL A PLUG continued

the world's population, we are consuming more than 30 per cent of the world's total supply of extracted minerals.

But you say America's "quality of life" far exceeds any other nation. Now that's an idea to toy with. For example, the average per capita, yearly consumption of energy by Americans is more than 50 per cent higher than that of the United Kingdom. Using the "quality of life" standard, life in the U. S. must be one and one-half times BETTER than it is in the United Kingdom. Or four times better than life in Japan.

Most anyone would have to agree that isn't true. And if it isn't, why do Americans consume so much energy every year? Do we really need twice as much energy every 10 years (a favorite fact of utilities)? Or are there ways to reduce that consumption?

For the most part, Americans commute to work alone in autos that get 12 miles to the gallon when they could join a car pool or take a bus. We open countless cans with an electric can opener that could be replaced with the good old-fashioned, hand-crank kind.

There are innumerable other ways to reduce energy consumption in the home; few have anything to do with a reduction in the American standard of living. For years we have wasted energy, thinking because it was cheap, it was unlimited.

Electricity is, by today's standards, relatively inexpensive. It isn't priced to reflect the environmental damage it causes. Every kilowatt-hour of electricity or gallon of gasoline we use means more strip mines, air pollution and power generating plants. And less habitat for fish and wildlife.

The Office of the Special Assistant to the President for Consumer Affairs and the U. S. Department of Commerce recently published a pamphlet on ways to reduce fuel consumption in household heating*—a topic that has nothing to do with a lower standard of living and much to do with wise use of energy resources. Some sources contend residential and commercial heating consumes one-fifth of all the energy expended in the U. S. Others list it as one-fourth. Whichever is correct, greater home efficiency will produce vast savings for the householder and the environment.

The pamphlet suggests 15 to 30 per cent of a family's heating bill is caused by warm air leakage or cold air infiltration. Their remedy is easy: weatherstrip movable joints and caulk the frames of all windows and doors. If a cold draft can be felt coming from a window or door that faces against the direction of the wind, the opening is leaking air. If windows are air tight, in quite cold weather a light, but not excessive, fog or mist of moisture occasionally develops on windows on the downwind side. And that mist will also improve the humidity level in your home—a double savings.

Storm windows or insulating glass will also go a long way toward cutting heat bills. In addition, they reduce the difference between room air and window temperatures, a chill-producer if you're standing near a window. According to the Commerce Department booklet, an investment in storm windows will return to you an annual dividend of 13 per cent or more on your investment. And if your home is air conditioned, those figures will be higher since storm windows are as effective in reducing heat gains in summer as they are in reducing heat loss in winter.

Another boon to heating and air conditioning costs is insulation. Here, the federal government suggests that investing in six inches of thermal insulation over your top floor ceiling will pay for itself in lower heating bills in one winter. Even if you now have several inches of insulation in your home, increasing it to six inches will decrease your heat bill and, after several years, return to you an annual dividend of some 12 to 15 per cent on your investment. (Your home will probably be used for 20 or 30 years, and if it's inefficient today, it will be wasteful for 20 or 30 years. And that's a lot of energy wasted and a lot of wildlife habitat destroyed.)

It is easy enough to insulate a ceiling under an unfloored and well ventilated attic: place batts of insulation on the ceiling or spread "loose insulation" over it. If the attic is floored, the installation process is slightly more difficult, but not impossible. Raise a few floor boards and blow or rake in "loose insulation."

Outside walls should also be insulated and represent an investment that will improve your comfort, pay for itself and give you and the environment a good return. It can easily be done when a house is built, but for an existing building, it is not something to undertake without expert technical advice. Sidewall insulation added to some existing buildings can lead to moisture condensation within walls.

Your heating bill is greatly affected by the efficiency of your furnace. Too much air or dirty filters will increase fuel consumption, so it is best to clean and adjust your furnace regularly. These steps will reduce the fuel input rate of your furnace. And when coupled with smaller orifices or jets in your burner and a proportionate decrease in combustion air, the system's performance will be maximized. Continuous use of a smaller furnace is actually more efficient than intermittent use of oversized equipment.

Even draperies will affect your home fuel bill. A closed fabric drapery will average the temperatures on either side of it. In cold weather, when the glass is chilled, the closed drapery will reduce

the heat loss of people sitting near a window, enough to improve their comfort without turning up the furnace thermostat. This savings is minute compared to storm windows and insulated glass, but it does much to improve personal comfort.

It is also important to close and seal tightly all openings into attics. Keep outdoor air vents open in attics and crawl spaces in the winter to prevent condensation of moisture in or on insulation or other building materials. But don't let that cold air leak into occupied space. Since indoor air is warmer and lighter, it tends to flow upward into an attic if there are openings available. Such flow represents a heat loss and an increase in heating bills, but it also carries moist air into the attic where it might condense or deposit as frost, ultimately wetting insulation.

Check the attic stairway doors or pull-down stairways, ceiling fans, plumbing vents or pipes or air ducts in your home. In a two-story home, with an indoor-outdoor temperature difference of 35° F., a one-inch square opening represents a heat flow of 55 Btu's (British thermal unit) per hour. This will cost the householder about 50 cents per square inch per winter in wasted heat. Although that doesn't sound like much, a 1/4-inch crack under a 3-foot door leading to an attic will result in $4.50 lost in heating each winter. Consider also the front door, back door and door to the basement, and the original $4.50 becomes $18.

Moisture flowing through a one-inch square opening is estimated as about ¾ pound per day for a home with a relative humidity (the ratio of the amount of water vapor in the air at a specific temperature compared to the maximum capacity of the air at that temperature) of 30 per cent. To be adequate, ventilation of an attic should equal about 1/300 of the attic floor area. Sufficient ventilation will carry away any moisture that might leak into a moderately well sealed attic. However, if leakage is excessive (if the total leakage area is greater than the attic floor area divided by 2,000), the capacity of the ventilating opening to remove moisture may be overtaxed at times of little wind. This is just one more reason to seal all leakage areas into the attic.

Whether you live in a house or in an apartment, turn off electric lights, television sets and radios when they aren't needed and reduce the use of electric appliances. Repair leaking hot water faucets immediately. (That hot water heater uses a tremendous amount of energy.) A leak of one drop per second adds up to about 650 gallons per year; a leak that fills an ordinary cup in 10 minutes wastes 3,280 gallons of heated water per year and costs about $6. A slow leak will also erode the metal valve seat and stain sinks, two more reasons for quick repairs. And lower the thermostat setting in your house at night.

Those are all hints from the Commerce Department pamphlet.

But there's more. Sun shades and awnings are an easy and ordinary way to conserve energy and wildlife habitat. And they correct the heat loss and heat gain problem at its source instead of letting it infiltrate the building and then trying to correct it with massive heating or cooling. Special exterior wall designs, reflective or heat-absorbent glass and overhangs do the same job.

Modern design techniques recently emphasized "all-glass" buildings that ignore the realities of nature and applauded the "100 per cent fresh air systems." Now we're finding the air inside is probably easier to clean than the air outside, to say nothing of re-heating or cooling the "fresh" air.

Lightweight home construction also takes its toll in fuel consumption. Though the initial costs may be lower, the homeowner and apartment dweller pays higher operating costs, uses more fuel, and wildlife is left with a damaged environment.

The same can be said for home siting and landscaping. If, according to ARCHITECTURAL RECORD, January 1972, a home is rectangular and two and one-half times longer than it is wide, building it in a north-south setting rather than east-west will cut the cooling load by 30 per cent. If trees are planted, another 25 per cent is knocked off.

The smart home builder will ask for complete, extensive cost studies before choosing his home design, heating and cooling systems and appliances. To illustrate, electric appliances are less efficient than their gas counterparts. Studies in a major, national laboratory show ranges, water heaters and clothes dryers operated on natural gas are 2 to 3.6 times more efficient and 3 to 6 times more economical to operate.

So there are ways to reduce energy consumption in the home—without diminishing the convenience, pleasure or quality of the American standard of living. Though it may not seem like much, it's one more step toward a cleaner, healthier environment for man and wildlife.

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*That pamphlet, Seven Ways to Reduce Fuel Consumption in Household Heating . . . through energy conservation, has been reprinted by the Bonneville Power Administration, U. S. Department of Interior, and is being distributed as a public service. Those methods are covered here, and all statistics are taken from the pamphlet.

MANAGEMENT EXPLAINED

THE CHANGING ROLE OF THE FISH HATCHERY

by Art Whitney

IT'S HARD TO find a fisherman who is indifferent about fish planting. In the hundred-odd years we Americans have been practicing the hatchery art, opinions have varied widely on how, where and when hatchery fish should be used.

In the last 20 to 40 years, biologists have entered the fish management scene with studies addressed to these how, when and where questions and to the additional question, "Should hatchery fish be used at all in certain instances?"

Occasional "no" answers to this last question were ignored at first, but the biologists' findings were eventually accepted, and the role of the hatchery in fish management changed considerably 20 to 25 years ago. Now, new findings appear likely to change the hatchery's role again. This article reviews the history of hatcheries in Montana's fisheries management program in order to give sportsmen a better understanding of changes that may soon be proposed.

The early days of hatcheries in Montana and elsewhere were characterized by an attitude of "plant everything you can wherever you can." Apparently we thought this would provide every part of our country with good fishing for all kinds of fish. This period had some remarkable successes (e.g. rainbow trout and brown trout in the upper Missouri and Yellowstone drainages, species which today afford the bulk of Montana's trout fishing). The period also had some quiet failures that were never seen again (e.g. Atlantic and Pacific salmon in the Mississippi-Missouri system), and some spectacular blunders from which we still suffer (e.g. perch and sunfish in sterile, western Montana trout lakes and carp over the entire North American continent).

After it became obvious not every fish could survive everywhere and some hasty introductions had been downright mistakes, planting emphasis switched to maintenance stocking. In Montana this consisted mostly of collecting eggs from trout on spawning runs. These eggs were taken to the hatchery, hatched, and the resultant fry and fingerlings stocked in a wide variety of waters.

In most cases, the species stocked was already present in those waters and was spawning naturally. Even though this was recognized, it was believed quality fishing could only be maintained by stocking. Fish in a stream were considered money in the bank—if you took some out, you better put some back or your account would eventually go broke.

One of the most unpopular actions of early fish biologists was to question this procedure. They came armed with the knowledge that fish have definite habitat requirements and with equipment like electric shockers to collect fish in smaller streams. These biologists were the first people to really "see" what was going on under the surface of the water, and what they saw was quite unsettling to the then established theory of fish management.

Until then, fish managers and anglers alike had assumed a stream's or lake's capacity to hold fish was limitless, and the more little ones you poured in, the more big ones you pulled out. The biologists' very early stream work showed this just wasn't so. Fish require food and cover like all animals. In the wild, they defend their own territories (homes), and the best spots go to the biggest and most aggressive fish. When all the "homes" are full, any fish left over soon disappear to predation or, in swifter streams, to exhaustion.

Fish have a high reproductive potential; that is, each pair of fish can produce many offspring. This assures a long "waiting line" for the next vacant "home." Adding small fish from a hatchery to most streams was just temporarily making the "waiting line" longer—the number of big fish in the stream was still governed by the amount of good habitat.

The futility of stocking small trout in a stream that has good natural spawning has been demonstrated in many parts of the world and is no longer done. The last maintenance plant of small trout in Montana was in the Little Blackfoot River in 1953. Note, however, the qualification "good natural spawning" on this conclusion about stocking. Where natural reproduction is lacking, maintenance plant-

ing of small trout is very effective in providing a fishery. This occurs almost exclusively on lakes and reservoirs. We know of only two streams (Big Horn River downstream from Yellowtail Dam and Warm Springs Creek in Fergus County) in Montana that provide all the essentials for trout except a place to spawn.

During the death of the "like money in the bank" maintenance planting concept, fish managers asked themselves, "Is there really anything we can do with hatchery fish to make stream trout fishing better or to maintain its quality in the face of heavy fishing pressure? If small fish have no effect, will larger ones—fish so big an angler could keep one when he caught it?"

Obviously, such a method did work in areas of heavy use. Where fishing pressure was high, anglers caught many of these fish, and they were caught "in addition" to wild fish.

So we entered the era in stream management of producing easy, instant roadside fishing with the catchable-sized (7 inches and longer) trout. This is a questionable operation from an economic standpoint for a state with Montana's light fishing pressure. Each daily limit of catchables we put in the creel costs more than we take in from a resident's season license fee. However, the program has been popular with many anglers. Those who caught the catchables enjoyed it, and the wild-fish fishermen, who had to pay for a program that gave them no benefit, didn't object.

The program was soon expanded to the maximum number of catchables our hatcheries could produce at their best operating levels. Smaller fish were also raised for the places where we were filling in for lack of natural reproduction. But from the mid-1950's through the early 1960's, catchables comprised most of the weight of the fish raised and distributed, and Montana's hatchery system changed to accomplish this.

In the early days of trout culture, fish were raised only to very small sizes, and distribution over long distances was slow and difficult. The hatchery system had been developed under these conditions and reflected their needs. In the early 1950's, we still had a number of little, cold-water stations scattered around the state. These smaller hatcheries had been fine for hatching eggs and stocking one- and two-inch trout the same year, but they took two years and more to raise trout to catchable size. Better distribution facilities (bigger, faster trucks, better roads, more efficient aeration systems) made long hauls from warm-water stations far more economical than trying to raise catchables in the old, small, cold-water hatcheries.

At the same time, new hatching techniques greatly increased the capability of all stations to produce newly hatched fry. Thus, the cold-water stations' characteristic of good egg hatching capability but poor capability for producing catchables made them obsolete. Over the years, these stations were disposed of because they were absorbing the sportsmen's dollars while providing little or no benefit to present or future Montana anglers.

Some important points that have been discovered about the catchable program are: (1) Of the total catchables caught, most are caught within two weeks of stocking and there is essentially no survival of catchables into the year following stocking. (2) Even in areas heavily stocked with catchables, the better fishermen still catch most of the fish, and the poorest fishermen still catch nothing. (3) Stocking catchables has increased the total number of fish caught by anglers in some stream sections.

Based on this data and the catchable program's popularity, it was continued under the theory it "put a little cream on top" without hurting anything, and even the angler who wanted only wild fish got a minor benefit from it. This is because catchables concentrate the less skilled fishermen in the stocked waters, thus reducing pressure on wild fish waters. To fit this program, the hatchery system reduced its number of units, greatly increased its distribution ability and produced catchables for a majority of Montana's better trout streams and all the sub-catchables it could for lake and reservoir stocking.

Also during this period of increasing catchable production, many studies demonstrated loss of habitat (i.e. channel straightening, pollution and dewatering) and not over-fishing constituted the real threat to the future of Montana's stream trout fishery. To the extent the catchable program ab-

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"Should hatchery fish be used at all in certain instances?"

FISH HATCHERY continued

sorbed funds needed for combating these activities, the program was seriously questioned and from its high point in the mid-1960's, catchable production has been considerably reduced. This has been done to produce more and slightly larger sub-catchables for lake and reservoir stocking and to provide more effort for habitat preservation work.

A comparison of our rainbow production (both state and federal) between 1952 and 1961 gives a good example of the changes in our hatchery system. Of the 1.9 million rainbow produced in 1952, only 108,000 (less than six per cent) were catchable size. In 1961, over 1.8 million catchables were raised, almost one-third of the 6 million rainbow we produced that year. The total number of fish produced in these years is not as different as these "rainbow only" figures indicate. Including all species, production was about 13 million in 1952 and 15 million in 1961, from both state and federal hatcheries. The almost 2 million annual catchable production of the early 1960's was far greater than could be warranted by Montana's relatively light fishing pressure. Returns to the creel of less than 20 per cent in many waters indicated a waste of sportsmen's dollars by this huge program.

Catchable production was gradually reduced until, at present, we are now stocking less than 700,000 catchable-sized rainbow trout annually in Montana public waters. This figure does not include an even greater number of federally raised catchables for Indian reservation waters, a program over which our department has had no jurisdiction in recent years. The effort that went into the higher catchable production from state hatcheries 10 years ago has been shifted, partly to production of smaller fish for lake and reservoir stocking and partly to more important, long-range programs like prevention of habitat loss from road building and other stream-side construction projects.

During the last 20 years, the amount of money spent on hatcheries in Montana has remained much more stable than that spent for other Fish and Game activities. Thus, in effect, the use of hatcheries has been de-emphasized as it has become more and more apparent habitat destruction and not over-fishing is the real specter that haunts the future of Montana's stream trout fishery.

We recently developed gear suitable for sampling large rivers and began to evaluate the effect of improved winter flows on trout in the Madison River. Early in the study, data indicated a heavy plant of catchable rainbows was depressing the wild rainbow and brown trout in one of our study sections. The study's emphasis was changed to better evaluate this effect. The study is now complete and shows a very sharp depression in numbers of wild trout coinciding with heavy plants of catchables. More surprising, it also shows immediate improvement when catchable plants stop. (For more complete information, see "The Catchable Trout" by Dick Vincent in the May/June 1972 issue of MONTANA OUTDOORS.)

The results of this study are now being prepared for scientific publication. After they are published, and if they withstand the criticism to which all new scientific ideas should be subjected, we must recommend a major change in stream fishery management. The recommendation will probably be to discontinue catchable stocking in streams with thriving wild trout populations. Since most Montana streams fit this category, the proposal calls for a marked reduction in the number of catchables produced.

This change, when and if it happens, will not end the value of the hatchery system. Nor will it mean we are abandoning all efforts to maintain a good stream fishery resource. Montana's hatchery system will still be used to raise smaller fish for the many lakes, reservoirs and occasional streams which can't support natural reproduction. Stream management efforts on the more important, long-range problems of preserving habitat and providing access can be increased. In streams where fishing pressure becomes heavy enough to degrade the quality of the sport, special regulations may become considerably more varied than they are today.

We in the fish management business know how emotional anglers can get about adding or cutting a plant in a favorite fishing hole, depending on whether or not the angler likes hatchery fish. We expect the Fish and Game Commission, after full consideration of all our data (including its scientific criticism), may decide to stop planting catchable trout in streams with good wild trout numbers. We hope Montana anglers will accept such a program change without either condemning all hatchery planting as bad (which it certainly isn't) or assuming we have abandoned all management of Montana's trout streams.

Our trout stream management efforts will increase with habitat preservation, special regulations and provision of public access. These activities (providing Montana law eventually prevents complete stream dewatering) will assure preservation of good stream trout fishing for anglers skilled enough to catch wild trout. The continued and possibly increased use of hatchery fish in lakes and reservoirs, where they are a valuable management tool, can provide ample trout fishing for those who now fish for hatchery catchables in streams.

Arthur N. Whitney is administrator of the department's fisheries division.

COONEY RESERVOIR RECREATION AREA

Cooney Reservoir was built in the 1930's by placing an earth dam below the junction of Willow Creek and Red Lodge Creek about 20 miles north of Red Lodge. While the reservoir was built solely for irrigation and flood control, it has grown into one of the most important recreation areas of the region.

Cooney holds about 750 surface acres of water when full and had an original capacity of about 27,000 acre-feet when first completed. (An acre-foot is one acre of water, one foot deep). However, a recent survey showed siltation has reduced its capacity to below 20,000 acre-feet.

The 1967 State Legislature charged the recreation and parks division of the Department of Fish and Game with management of land surrounding Cooney—about 1,000 acres. However, the Rock Creek Water Users Association retained complete control of water levels.

The department immediately developed a long-range master plan for the area—an attempt to make Cooney more enjoyable for the most people over a long time period. Use of the rather small reservoir in a wide variety of ways made the master planning effort very difficult. Planners had to consider water skiers', trollers', pleasure boaters', bank fishermen's, swimmers', hunters' and others' preferences. The completed plan was presented to many interested organizations and clubs in the area. A few compromises were worked out, and the plan gained general acceptance.

The 1969 State Legislature authorized the department to spend $100,000 on Cooney improvements. The Federal Land and Water Conservation Fund provided one-half this total and the State Motor Boat Fuel Tax provided the other $50,000. No fishing or hunting license money was spent for recreation facilities, land or maintenance.

While building all the facilities outlined in the master plan will cost about $450,000, the 1969 appropriation improved the recreation area greatly. It provided new north- and south-shore access roads and parking areas, sanitary facilities, picnic tables and grills, two boat ramps, one small boat dock, some boundary fencing and additional key land tracts.

Future developments as legislative authority and funds permit will include further access road construction, a badly needed campground, a marina and additional boating facilities.

The game management division began converting much Cooney land, formerly used for agriculture, into wildlife habitat two years ago. Re-seeding steep slopes to native grasses, leaving grain standing along the brushy arms of the reservoir, fencing and elimination of heavy grazing should increase the number of pheasants, Hungarian partridge, sharptail grouse, ducks, geese, deer and other wildlife which lives there now.

Trout cannot reproduce in Cooney because of heavy siltation. Rough fish, mainly suckers, thrive in this kind of habitat and eventually almost eliminate trout through competition for food and space. In 1970 suckers outnumbered trout more than 9 to 1. The Rock Creek Water Users Association, which controls Cooney water levels, did the area's fishermen a real service that fall by lowering the water level to about 5,000 acre-feet so the fish population could be temporarily eliminated. Fisheries biologists used rotenone, a chemical which suffocates fish and quickly breaks down into harmless residues, to rehabilitate the reservoir. The department planted about 1,200 three- to five-pound trout early the next spring, along with 250,000 rainbow fingerlings. Fishermen missed only one winter season, and fishing has been good since. However, it will undoubtedly deteriorate during the next few years as the sucker population grows, even though the department plants the reservoir annually with trout fingerlings. The rehabilitation cycle seems to "operate" on about 10-year intervals, so another "rehab" will probably be needed a few years from now if trout fishing is to remain good.

One department survey ranked Cooney number eight in fishing pressure of all Montana lakes. No matter what the weather, someone always seems to be fishing there. On many summer days you can find over 100 boats on the reservoir at once and many picnickers and swimmers enjoying themselves. Hopefully full implementation of the long-range master plan will improve everyone's enjoyment of this heavily used and valuable recreation area.—*John Pearson*

location and notes

Cooney Reservoir is located in southern Carbon County on an unpaved road eight miles west of U. S. Highway 212 and 48 miles southeast of Billings.